Causes of Depression: A Macro-Analysis

Nur Syazwani Zakaria, Fadli Fizari Abu Hassan Asari, Abdul Hafiz Yusof,
Norhisam Bulot and Wan Mohd Yaseer Mohd Abdoh
Faculty of Business and Management, Universiti Teknologi MARA,
Perlis Branch, Arau Campus, 02600 Arau, Perlis.

Abstract: Depression is one of the mental disorders that can be detected through prolonged sadness, low self-esteem, poor concentration and extreme fatigue; which may lead to suicide. According to the WHO, 322 million people or 4% of the world's population suffered from depression in 2015. On the other hand, the Asia recorded the highest percentage of suicides in 2017, as compared to other continents. Thus, it is important to identify the main causes of these worrying statistics. Using a macro perspective, four different continuums (employability, chronic pain, cyber bullying and working reward) have been proposed. The main idea is to explore the relationship between these four variables with the depression rate and to identify the most influential cause. A set of panel data for a 10-year period (2008-2017) which includes of 15 selected Asian countries has been analysed. Statistically, chronic pain and working reward are significant toward depression cases. In addition, chronic pain is more influential than working reward, in contributing to the growing numbers of depression. For future studies, more causes including qualitative variable can be added and analysed. The samples can also be extended, in studying the similarities and differences between the Asia and other continents. Despite limitations, the result and finding of this study are still relevant and can contribute significantly toward body of knowledge in the respective area.

Key words: *Depression, Suicide, Asia, Good health and well-being*

INTRODUCTION

Depression is one of mental illnesses that can be recognized by feelings of sorrow, self-isolated, low self-assurance, interrupted sleep or appetite, fatigue, and bad concentration. There are three categories of depressive episodes; mild, moderate, and severe which each category is depends on the number and severity of the symptoms [1]. In 2015, over 4% of the global population was living with depression. This indicates that the number increased by over 18% within 10 years which between 2005 and 2015. 27% of global population who were suffered from depression came from South-East Asia region. When comparing between gender, women is more common with depression with 5.1% compared with men and children below the age of 15 years old had lesser cases of depression than in elderly groups. All these facts were highlighted in the [2].

Depression also can lead to suicide. There were 800 000 cases recorded people who died by suicide in 2015 alone and this make suicide was the second leading cause of death among 15 to 29 years old in 2015 [3]. Surprisingly, according to the World Health Organization (WHO), South-East Asia region, countries in Asia have a higher average suicide rate to compare with other countries [4]. Personal, social, psychosocial, cultural, biological, and environmental are among the factors that contribute to suicidal behaviour. The most common psychiatric disorder in people who die by suicide is depression which about half of people who living in high income countries who end their life by suicidal have major depressive disorder [5].

Although the factor and effects of depression are known, fewer than 10% of depressive victims in many countries receive treatments. The main reasons

Corresponding Author: Nur Syazwani Zakaria, Faculty of Business and Management, Universiti Teknologi MARA, Perlis Branch, Arau Campus, 02600 Arau, Perlis, Malaysia, 017-4069556

are shortage of resources and health professionals, plus societal stigma regarding with mental illness are among the barriers for effective care [6]. Another obstacle for competent cure for this illness is false assessment where person with depressive disorder is misdiagnosed while others who do not have the disorder been prescribed with antidepressants [7]. The major question which may raise here what is the most dominant factor that contributed to this number? Does it driven by the unemployment rate, chronic pain, cyber-bullying, or compensation received by employees?

Represents by percentage of unemployment of total labour force for unemployment rate, DALYs for chronic pain, number of internet users for cyber bullying, and compensation of employees for compensation received by employees, this study has two objectives to be fulfilled. Firstly, what are the relationships between these four variables with depression rate and secondly, to investigate the most influential factor among these four selected variables. A set of panel data for a 10 years period (2008-2017) which consists a data from 15 countries in Asia includes in East Asia (Japan), South Asia (Sri Lanka), Southeast Asia (Malaysia), and West Asia (Afghanistan) has been analysed in order to answer the two objectives stated earlier.

LITERATURE REVIEWS

There is different between depression and usual mood fluctuations and depression may become a threat towards sufferer's health condition especially in long-run duration and depending on the mild or severity of the depressive level. Psychosocial factors such as interpersonal problems and societal pressure, and biological factors are the most important factors that contribute to depression [8]. On the other hand, depression also can be influenced by psychosocial factors alone [9]. In [10], genetic factors, stress, and childhood problem are among the reasons that have huge impact on depression cases.

In comparison between persons with chronic back pain and pain-free persons, persons with chronic back pain have higher tendency to depress [11]. Chronic condition such as back or neck problems, chronic headache, and multiple pains shows the highest relation with both depression and anxiety

disorder. Conversely, physical conditions such as diabetes, and asthma show the weakest relationship with mental disorder [12]. In detail, diabetes is highly correlated with physical (as shown by Physical Component Summary score - PCS), and asthma more on Mental Component Summary score (MCS) [13]. Additionally, chronic fatigue is another major cause of depression among children [14].

The impacts of both traditional bully and electronic bully are same. The victims will suffer the emotional stress and at the end become depressed. [15]. In addition, depressed individuals have smaller social networks diversity as compared to individual without depression [16]. The reason is that the growing number of networking can increase the psychosocial distress to the sufferer. In a comparison, post-traumatic stress disorder or PTSD cases are more recorded in military areas as compare to civilian areas, and frequently-deploying military areas recorded higher cases than less-deploying areas [17]. After all, victims of cyber bullying admitted to more suicide attempts than other internet users as highlighted in [18].

Insufficient social support means low of emotional and social support in working area, disturbance in occupational climate, plus lack of reward [19]. In [20], it is highlighted that all job satisfaction categories, including 'physical environment and job opportunities', 'management style and job enrichment', and 'rewards and job security' proved to be significant and negatively related with work stress. According to Depression Anxiety Stress Scales (DASS), DASS-Anxiety, and DASS-Stress are strongly related to psychosocial job demand (work fast), job insecurity (not good job security), and hazardous condition (exposure to things placed dangerously, dirty) [21].

Stress, anxiety, and depression are strongly related with people who are unemployed or who are fears to be fired [22]. Job loss significantly have negative impact on the unemployed individuals such as chronic stress, increase in drinking and smoking, and the possible worse effect is suicidal intentions [23]. In contrast, there is no clear relationship between unemployment and depression as written in [24]. The same study also highlights that the unemployment does not contribute for hike in bad habits such as drinking and smoking. This is in line

with a study by [25], where change in unemployment does not influence the tendency for depressive symptoms. Only increase in material distress such as financial stress, and poverty can lead to the increment of depressive chances.

METHODOLOGY

Model

It uses panel data set (2008-2017) which consists of one dependent variable and four independent variables. The estimated logarithm equation is written as follows;

$$ln(\widehat{DEPR})_{i,t} = \alpha + \beta 1 ln(CHRO)_{i,t} + \beta 2 ln(CYBER)_{i,t} + \beta 3 ln(COMPE)_{i,t} + \beta 4 ln(UNEMP)_{i,t} + u_{i,t}$$

Equation 1

Where:

DEPR	:	Depression
CHRO	:	Chronic pain
CYBER	:	Cyber bully
COMPE	:	Compensation of employees
UNEMP	:	Unemployment
u	:	Error term
ln	:	Natural logarithm
i,t	:	Cross-section & Time-series

Data retrieval

i) Depression (DEPR)
Represents by number of depression cases for each selected Asian country. Data has been obtained from World Databank: 2019 Statistical online database. It is valued in total number.

ii) Chronic Pain (CHRO)
Represents by Disability-Adjusted Life Years or known as DALYs. One DALY represent one lost year of healthy life. Data has been obtained from Our World in Data online database. It is valued in numbers of years.

iii) Cyber bullying (CYBER)
Represents by number of persons who have internet access from various locations via various types of gadget. Data has been obtained from World Databank: 2019 Statistical online database. It is valued in numbers of users.

iv) Compensation for employees (COMPE)
Represents by average compensation of employees which includes monetary and non-monetary items and government contribution to social insurance schemes. Data has been obtained from World Databank: 2019 Statistical online database. It is valued in US Dollar.

v) Unemployment (UNEMP)
Represents by number of unemployed workers or those who seek for employment. Data has been obtained from World Databank: 2019 Statistical online database. It is valued in percentage of total labour force.

Data analysis

All the data collected was inserted into the Microsoft Excel on yearly basis. Before processed using STATA Special Edition 14.0 (STATA SE 14.0), the data was converted into natural logarithm manually in Microsoft Excel. This is important as the coefficient can be used to determine the elasticity of each variable. The data was regressed using the most suitable static panel data method. The analysis made later including the significance of the model, significance of each independent variable, relationship between each independent variable and the dependent variable and, the contribution of all independent variables on the dependent variable. More important, how can the result fulfil the two objectives earlier stated in the introduction part.

RESULT AND DISCUSSION

As shown in Table 1, the regression result using Random Effect Model (REM) approach, explains that the model fits the data well at the 0.01 significance level. The adjusted R^2 of 0.9906 or 99.06% suggests that the four independent variables explain 99.06% of the variance in the dependent variable which is the percentage of depression over population. The remaining 0.04% is explained by other variables that are not included in this model.

Represents by Disability-Adjusted Life Years (DALYs), the result of the regression reveals that chronic pain (CHRO) has a statistically significant negative relationship with percentage of depression cases over population. A 1% increase in DALYs (which mean increase in premature death and time spent disabled by disease), will decrease 0.08% in total depression over population. This fact is acceptable given the diminished quality of life caused by both communicable and non-communicable diseases, reflects the low quality of life for any community. This makes the community becomes insecure and may contribute to prolonged depression among people. Another significant variable is compensation of employee or (COMPE). The COMPE has a statistically significant positive relationship with percentage of depression cases. A 1% increase in employee compensation will increase depression (DEPR) by 0.04%. The increment of percentage of depression when the compensation increased is due to the increase in responsibilities or job scope for that person. In another word, when the compensation increases, automatically it comes with more responsibilities for the job, thus will increase the tendency for depression. Between the two independent variable, chronic pain is more influencing as compare to compensation. This conclusion can be made by looking on the higher elasticity of compensation by 0.08% as compare to chronic pain (0.04%).

Table 1: Regression result

CHRO	-0.0802**
	(-2.13)
CYBER	0.0019
	(0.42)
COMPE	0.0404***
	(3.80)
UNEMP	0.0158
	(1.05)
Constant	1.2794**
	(1.99)
N	150.0000
R^2	0.9917
R^2 adjusted	0.9906
F	13.5994
p	0.0000

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Unemployment (UNEMP) does not appear to be significantly related to the percentage of depression cases over population. This mean that a one percent increase in unemployment does not correlated to the increment of percentage of depression cases. Other than that, cyber bullying (CYBER) represents by number of internet users has also no significant relationship with percentage of depression cases over population. As a result, null hypothesis for both variables cannot be rejected.

CONCLUSION AND RECOMMENDATION

Out of 4 (four) selected independent variables, chronic pain (CHRO) and compensation of employees (COMPE) have a statistically significant relationship with percentage of depression cases. The result also suggest that chronic pain (CHRO) is negatively related to the percentage of depression over population, whereas compensation of employees (COMPE) is positively related to the total depression. Out of these two variables, chronic pain (CHRO) is more elastic as compare to compensation of employee or (COMPE). At the same time, both unemployment (UNEMP) and cyber bullying (CYBER) are insignificant at all.

For future studies, it is proposed that more variables from other continuums to be added into the model. Separate analysis on each Asian country can be done for the purpose of detailing. Despite of limitations in this study, the result and finding are still relevant and can contribute significantly towards body of knowledge in this area.

REFERENCES

[1] National Collaborating Centre for Mental Health (UK), "Depression: The Treatment and Management of Depression in Adults (Updated Edition)", Leicester (UK): *British Psychological Society*; 2010. NICE Clinical Guidelines, No. 90, [Online]. Available: https://www.ncbi.nlm.nih.gov/books/NBK63740. [Accessed: Mar. 2019].

[2] World Health Organization, "Depression and Other Common Mental Disorders: *Global Health Estimates*, 2017. [Online]. Available: https://apps.who.int/iris/bitstream/handle/10665/25

4610/WHO-MSD-MER-2017.2-eng.pdf. [Accessed Apr. 2019].

[3] World Health Organization, "Depression", 2019. [Online]. Available: https://www.who.int/news-room/fact-sheets/detail/depression. [Accessed June 2019].

[4] World Health Organization,"Suicide and Suicide Prevention in Asia," *World Health Organization: Department of Mental Health and Substance Abuse*, 2008. Available: https://www.who.int/mental_health/resources/suicide_prevention_asia.pdf. [Accessed Mar. 2019]

[5] Cavanagh, Jonathan & Carson, Alan & Sharpe, Michael & Lawrie, and Stephen, "Psychological Autopsy Studies of Suicide: A Systematic Review," *Psychological Medicine*, vol. 33, p. 395-405, 2003. Available: https://www.researchgate.net/publication/10798556 . [Accessed May 2019].

[6] World Federation for Mental Health, "Depression: A Global Crisis", *World Mental Health Day*, Oct. 10, 2012. [Online]. Available: https://www.who.int/mental_health/management/depression/wfmh_paper_depression_wmhd_2012.pdf. [Accessed Mar. 2019].

[7] Singh, T., and Rajput, M.," Misdiagnosis of bipolar disorder. Psychiatry,"*Edgmont (Pa. : Township)),* vol. 3(10), p. 57–63, 2006. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2945875/.[Accessed Mar. 2019]

[8] Cleveland, H. R., Baumann, A., Zäske, H., Jänner, M., Icks, A., and Gaebel, W., "Association of Lay Beliefs about Causes of Depression with Social Distance," *Acta Psychiatrica Scandinavica*, vol. 128(5), p. 397-405. Available: https://onlinelibrary.wiley.com/doi/abs/10.1111/acps.12088. [Accessed Apr. 2019].

[9] McClelland, A., Khanam, S., and Furnham, A., "Cultural and Age Differences in Beliefs about Depression: British Bangladeshis vs. British Whites," *Mental health, religion & culture*, vol. 17(3), p. 225-238, 2014. Available: http://discovery.ucl.ac.uk/1418708/1/10.1080-13674676.2013.785710.pdf. [Accessed June 2019].

[10] Kumiko Y., Nicola J. R., A. Rossetto and Yoshibumi N., "Associations between Beliefs about the Causes of Mental Disorders and Stigmatizing Attitudes: Results of a Mental Health Literacy and Stigma Survey of the Japanese Public," *International Journal of Mental Health*, vol. 45:3, p. 183-192, 2016. Available:

https://www.tandfonline.com/doi/abs/10.1080/00207411.2016.1204810. [Accessed May 2019].

[11] Currie, S. R., and Wang, J., "Chronic Back Pain and Major Depression in the General Canadian Population," *Pain*, vol. 107(1-2), p. 54-60, 2004. Available: https://www.somasimple.com/pdf_files/lbp_depression.pdf. [Accessed May 2019].

[12] Scott, K. M., Bruffaerts, R., Tsang, A., Ormel, J., Alonso, J., Angermeyer, M. C., ... and Gasquet, I., "Depression–anxiety relationships with chronic physical condition: results from the World Mental Health Surveys," *Affect Disord*er, vol. 103(1-3), p. 113–120, 2007. Available: http://public-files.prbb.org/publicacions/702e8130-589b-012a-a767-000c293b26d5.pdf. [Accessed Apr. 2019].

[13] Demoly, P., Annunziata, K., Gubba, E., and Adamek, L., "Repeated cross-sectional survey of patient-reported asthma control in Europe in the past 5 years," *European Respiratory Review*, vol. 21(123), p. 66–74, 2012. Available: https://err.ersjournals.com/content/21/123/66. [Accessed Mar.2019].

[14] Patel, M. X., Smith, D. G., Chalder, T., & Wessely, S.," Chronic fatigue syndrome in children: a cross sectional survey," *Archives of Disease in Childhood*, vol. 88(10), p. 894-898, 2003. Available: https://www.researchgate.net/publication/9088920_Chronic_fatigue_syndrome_in_children_A_cross_sectional_survey. [Accessed Apr. 2019].

[15] Perren, S., Dooley, J., Shaw, T., and Cross, D.," Bullying in school and cyberspace: Associations with depressive symptoms in Swiss and Australian adolescents," *Child Adolescelent Psychiatry Mental Health*, vol.4, p. 28, 2010. Available: https://capmh.biomedcentral.com/articles/10.1186/1753-2000-4-28. [Accessed Mar. 2019]

[16] Seabrook, E. M., Kern, M. L., and Rickard, N. S.,"Social networking sites, depression, and anxiety: a systematic review," *JMIR mental health*, vol. 3(4), p. 50, 2016. Available: https://mental.jmir.org/2016/4/e50/. [Accessed May 2019].

[17] Coppersmith, G., Harman, C., and Dredze, M.,"Measuring post-traumatic stress disorder in Twitter," *In Eighth international AAAI conference on weblogs and social media ICWSM*, p. 579-582, 2014. Available: https://www.cs.jhu.edu/~mdredze/publications/2014_icwsm_ptsd.pdf. {Accessed June 2019].

[18] Schenk, A. M., and Fremouw, W. J. "Prevalence, Psychological Impact, and Coping of Cyberbully Victims among College Students," *Journal of School Violence*, vol. 11(1), p. 21-37, 2012. Available: https://www.researchgate.net/profile/Allison_Schenk/publication/233150757_Prevalence_Psychological_Impact_and_Coping_of_Cyberbully_Victims_Among_College_Students/links/547e76de0cf2de80e7cc57dd.pdf. [Accessed June 2019].

[19] Reblin, M., & Uchino, B. N.,"Social and Emotional Support and Its Implication for Health," *Current opinion in psychiatry*, vol. 21(2), p. 201–205, 2008. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2729718/. [Accessed Apr. 2019].

[20] Cho, J. J., Kim, J. Y., Chang, S. J., Fiedler, N., Koh, S. B., Crabtree, B. F., ... and Choi, Y. H., "Occupational stress and depression in Korean employees," *International Archives of Occupational and Environmental Health*, vol. 82(1), p. 47-57, 2008. Available: https://www.researchgate.net/profile/Nancy_Fiedler/publication/5550372_Occupational_stress_and_depression_in_Korean_employees/links/5433f5ad0cf294006f7309bb.pdf. [Accessed Mar. 2019].

[21] Edimansyah, B. A., Rusli, B. N., Naing, L., Rusli, B. A. M., Winn, T., and Ariff, B. R. H. T. M., "Self-perceived depression, anxiety, stress and their relationships with psychosocial job factors in male automotive assembly workers", *Industrial health*, vol. 46(1), p. 90-100, 2008. Available: https://www.jstage.jst.go.jp/article/indhealth/46/1/46_1_90/_pdf. [Accessed: May 2019]

[22] Bordea, E. N., Pellegrini, A., and Manea, M., "Unemployment and Coping with Stress, Anxiety, and Depression". *Czech Journal of Social Sciences, Business and Economics*, vol. 6(2), p. 6-14, 2017.Available: http://www.zbw.eu/econis-archiv/bitstream/handle/11159/800/Bordea%20et%20al%202017.pdf?sequence=1. [Accessed Mar. 2019].

[23] Stankūnas, M., Kalėdienė, R., and Starkuvienė, S.," Sense of coherence and its associations with psychosocial health: results of survey of the unemployed in Kaunas," *Medicina (Kaunas, Lithuania)*, vol. 45, p. 807, 2009. Available: https://www.researchgate.net/profile/Ramune_Kalediene/publication/40483483_Sense_of_coherence_and_its_associations_with_psychosocial_health_Results_of_survey_of_the_unemployed_in_Kaunas/links/0c9605162f456ae5ba000000.pdf. [Accessed Apr. 2019].

[24] Bobak, M., Pikhart, H., Pajak, A., Kubinova, R., Malyutina, S., Sebakova, H.,and Marmot, M., "Depressive symptoms in urban population samples in Russia, Poland and the Czech Republic," *The British Journal of Psychiatry*, vol. 188(4), p. 359-365, 2006. Available: https://s3.amazonaws.com/academia.edu.documents/44595943/359.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1556593336&Signature=LbUvgxvLz2AwOjyQfKeKmO55aaU%3D&response-content-disposition=inline%3B%20filename%3DDepressive_symptoms_in_urban_population.pdf. [Accessed Mar. 2019].

[25] Lorant, V., Croux, C., Weich, S., Deliège, D., Mackenbach, J., and Ansseau, M.," Depression and socio-economic risk factors: 7-year longitudinal population study," *The British Journal of Psychiatry*, vol. 190(4), p. 293-298, 2007. [Online serial]. Available: https://www.researchgate.net/profile/Vincent_Lorant/publication/51382747_Depression_and_socio-economic_risk_factors_7-Year_longitudinal_population_study/links/00463528cc81c2ee25000000.pdf. [Accessed June 2019].