

A REVIEW ON THE ASSOCIATION OF MENTAL DISORDERS AND WORKERS' PRODUCTIVITY IN MALAYSIA

*Mat N., Samsudin S., Applanaidu S.D.

Department Of Economics and Agribusiness, School Of Economics, Finance & Banking, College of Business, Universiti Utara Malaysia

**Corresponding author: Norzahirah Mat, Department Of Economics and Agribusiness, School Of Economics, Finance & Banking, College of Business, Universiti Utara Malaysia, 06010, Sintok, Kedah. Email: irzanina_89@yahoo.com*

<https://doi.org/10.32827/ijphcs.8.3.1>

ABSTRACT

Background: This paper reviews the past studies on mental disorders in Malaysia since it becomes a threat in developed and developing countries. Past studies in other countries have investigated the relationship between mental disorders with at-work productivity loss. However, the issues between mental disorders and at-work productivity loss in Malaysia have remained unclear and vague. Hence, this paper aims to identify the effect of mental disorders on work productivity in Malaysia and sheds light on future research based on previously published evidence.

Materials and Methods: This paper summarizes and synthesizes the findings from previous studies on mental disorders in Malaysia and relates to productivity loss. The studies were identified by using electronic databases and the papers were selected according to the inclusion criteria to find relevant journal articles related to issues, prevalence, associated risk factors, and productivity.

Result: Mental disorders such as depression and anxiety are considered a common mental disorders in Malaysia. Most of the studies on mental disorders only determined the prevalence and associated risk factors but overlook the impact of productivity loss among workers. Besides, schizophrenia also costs a huge economic burden despite the low prevalence. Hence, this study enlightens future research to address the issue of productivity loss among workers due to mental disorders as it gives a substantial impact on the economic burden.

Conclusion: This study thus illuminates future research in Malaysia to resolve the issue of productivity loss among employees due to mental problems, as it has a direct economic burden.

Keywords: Mental disorders, depression, anxiety, productivity, risk factor

1.0 Introduction

Mental disorders are one of the diseases that need treatments like physical disorders and it becomes a global alarming issue since the prevalence of the diseases keeps increasing. Mental disorders also become a major cause of the overall disease burden worldwide. The common mental disorders listed are anxiety and depression. However, among all types of mental disorders, depression is a leading cause of disability worldwide (Hassan, Hassan, Kassim, & Hamzah, 2018) and projected to be the second leading global cause of disease burden after heart disease in the year 2020 (Murray & Lopez, 1996) and affects to the economic burden (Cloutier, Greene, Guerin, Touya, & Wu, 2018; Greenberg et al., 2003; Marcellusi et al., 2018; Stephens & Joubert, 2001).

In brief, mental health is defined as the ability of the individual, group, and environment to act together in ways of promoting subjective well-being, optimal development of mental ability, and the success of individual and collective goals (Jamaiyah, 2000). This main concept of mental health is consistent with the World Health Organization (WHO), (2004) that describes mental health as a state of well-being of the individual that realizes their abilities, able to handle with the usual life's stresses, work efficiently, and capable to contribute to their community. In contrast, mental disorders such as depression, anxiety, schizophrenia, and bipolar disorders may disrupt the interaction between individuals, groups, and also the environment.

The issue of mental disorders deserved greater attention especially in Malaysia since the National Health and Morbidity Survey (NHMS) reported the prevalence of mental disorders increased significantly from the year 1996 to 2015 and expected to be the main problem among Malaysians (Hassan et al., 2018). Also, NHMS 2015 reported the prevalence of mental disorders among those aged 16 years and above was 29.9 percent as approximately 4.2 million. It shows that one of three Malaysian has suffered from mental disorders and this situation is very worrying that twofold raised in the prevalence of mental disorders over the past 10 years of 10.7 percent in NHMS II (1996) and 11.2 percent in NHMS III (2006) as shown in Figure 1. However, NHMS IV (2011) reported prevalence of mental disorders at the lowest may be associated with under-reporting by the informers and used poor validity of assessment tools (Guan, 2014; Siti Fatimah, Sherina, Lekhraj, & Firdaus, 2014).

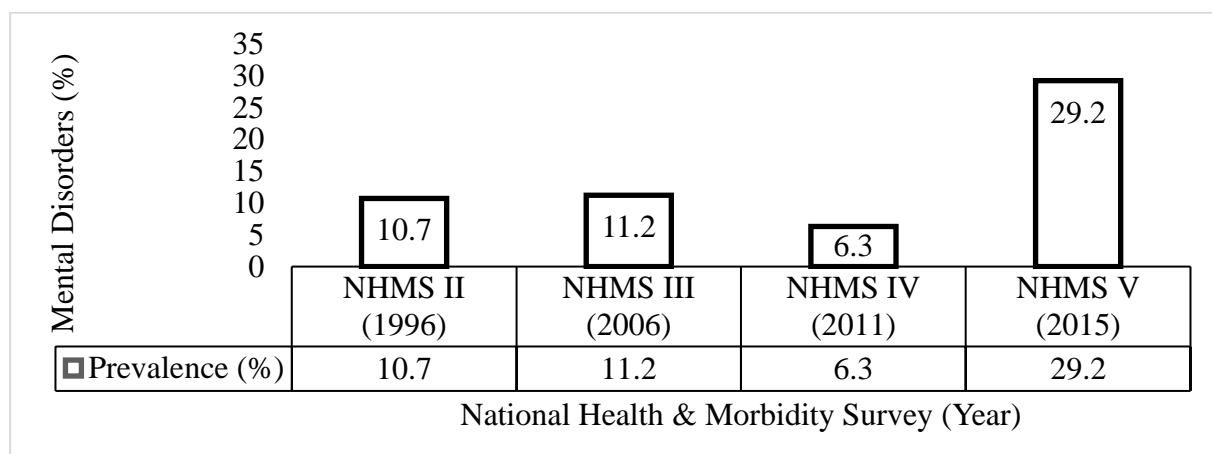


Figure 1. Prevalence of Mental Disorders in Malaysia

Source: Institute of Public Health, National Health and Morbidity Survey II, III, IV
 Few studies in developed countries have systematically examined the relationship between at-work productivity and mental disorders using population surveys (Lim, Sanderson, & Andrews, 2000). However, the type of study is still underutilized despite the increasing prevalence of mental disorders in developing countries such as Malaysia. Hence, this study reviews the published articles on the issues associated with mental disorders in Malaysia to provide a piece of information and awareness among employers, researchers, and policymakers for future research.

In brief, this paper is divided into five sections. First, the introduction of this paper discusses the issue, definition, and types of mental disorders. Second, the method process explains a flow chart of the selected paper and data extraction of the analysis. Third, the results section analyses the issues of mental disorders consist of depression, depression and anxiety, and schizophrenia. Fourth, the discussion section discusses the findings of the study. Finally, the conclusion and recommendations sections discuss the impact of mental disorders on the economy and provide some suggestions for future research.

1.1 Definition, Types, and Issues of Mental Disorders

The definition and types of mental disorders are shown in Table 1.

Table 1. Type and definition of Mental Disorders

Type	Definition
Depression	Lack of interest in daily life, being sad and feeling unimportance or excessive guilt that is severe enough and disturb their work, sleep, study, eating, and enjoying life.
Anxiety	Felt excessive anxiety and worry, consistently imaging the terrible things even when there is unsure cause for fear. They expect tragedy or extremely worried about money, health, family, work, and other matters.
Schizophrenia	A very serious mental disorders that emerges in late adolescence and cause several signs such as hallucinations, delusions, loss of personality, uncertainty, agitation, social withdrawal, and extremely odd behaviour.
Bipolar Disorders	A disorder that cause severe and strangely high and low shifts in mood, energy, and activity levels as well as unusual change in the capability to carry out daily tasks.

Source: The National Institute of Mental Health, 2020

The disruption of mental disorders might arise within the individual itself such as physical disorders or from external cause likes socioeconomic status, location, ethnic variation, exposure to violence, divorce, and constant criticism (Jamaiyah, 2000; Krishnaswamy et al., 2012; Teoh, 2010). Those who suffer from mental disorders may be weak in doing their work, study, and daily activities. At an aggregated level, these disorders may harm on country's productivity, growth, and economic development (Cole & Neumayer, 2006). Hence, the objective of this paper is to review past studies on mental disorders in Malaysia by presenting the big picture of the current situation of the disorders and linked it with workers' productivity.

According to Zhang, Bansback, and Anis (2011), there is a growing recognition in developing countries that health factors are critical in influencing at-work productivity. Prior studies have been linked to the increased numbers of disability days among workers with mental disorders.

This situation could lead to productivity loss and increased health care cost (Burton, Schultz, Chen, & Edington, 2008; Hassan et al., 2018; Kessler & Frank, 1997; Laitinen-krispijn & Bijl, 2000). Mental disorders also include as the top 10 health conditions that incur health-related costs to the employers (Goetzel et al., 2003; Wang et al., 2003). Usually, at-work productivity loss has been measured by using absenteeism and presenteeism (Scott, 2005). Absenteeism is characterized as being away from scheduled work (Kessler & Frank, 1997; Lim et al., 2000; Lofland, Pizzi, & Frick, 2004; Vaingankar et al., 2015), while presenteeism is characterized by coming to work regardless of the impaired physical or psychological health problem without reflecting the real job functions (Bielecky et al., 2015; Evans-Lacko & Knapp, 2016; Schultz & Edington, 2007; Wee et al., 2019). Presenteeism also causes a larger source of aggregate productivity loss compared to absenteeism (Collins et al., 2005) and it also could worsen the quality of working life and manage to reduce productivity (Johns, 2010).

Past studies on mental disorders stated that depression is one of the worse conditions in the USA associated to absenteeism and presenteeism (Berndt, Bailit, Keller, Verner, & Finkelstein, 2000; McCunney, 2001). For example, absenteeism attributed to depression led to annual productivity losses of \$17 billion (Greenberg et al., 2003). While in Australia, 20 million work impairment days annually (absenteeism) among full-time workers were associated with anxiety and affective disorders (Kessler et al., 1999). Another study in Australia stated the productivity loss due to mental disorders among workers was \$ AU 2.7 billion in the year 2009 (Hilton, Scuffham, Vecchio, & Whiteford, 2010). Whereas in England, the total cost of working days lost due to depression was 109.7 million in the year 2000 (Thomas & Morris, 2003).

Whilst Evans-Lacko and Knapp, (2016) explored the impact of depression across eight diverse countries (Brazil, Canada, China, Japan, South Korea, Mexico, South Africa, & the USA) on workplace productivity and the results show the lowest cost of absenteeism due to depression was in South Korea (\$181) and the highest in Japan (\$2674). For presenteeism, the lowest cost due to depression was China, and the highest was Brazil. Due to the findings of the past studies, mental disorders such as depression impact productivity among workers and this condition considerable across all countries.

2.0 Materials and Methods

The literature search designed to find all journal articles relating to mental disorders (depression, anxiety, schizophrenia, and bipolar disorder) related to productivity among workers in terms of absenteeism and presenteeism in Malaysia. The inclusion criteria for the study were papers published between the years 2000 and 2019, which considered adults of working age (18-65). We systematically seek out the electronic databases (Cambridge Journal Online, SAGE Journals, Emerald Insights, Institute of Education Science, Proquest, Elsevier, Mendeley, & Google Scholar) up to April 2nd, 2020 to find relevant journal articles associated with mental disorders, factors associated of mental disorders, and productivity among working-age citizens specifically in Malaysia. All references from articles identified in the original search were also search for additional evidence. A combination of free-text terms and thesaurus has been identified and used in the research. Each keyword was searched alone and then merged the keywords to eliminate duplication. The keywords consist of “mental health disorders’ OR ‘depression’ OR “anxiety” OR “schizophrenia” OR “bipolar disorder” with “productivity” OR “absenteeism” OR “presenteeism” OR ‘work loss” specifically in Malaysia. Other studies dealing with mental disorders were excluded as these articles are linked with other fields of study.

2.1 Data Extraction and Analysis

These papers were critically appraised as shown in Figure 2 and the relevant information has been extracted into a summary table designed by the authors based on previous studies. This included year, authors, types of condition, study population, ethnicity, gender, and significant factors that influence key outcomes. In total, about 478 papers have been identified from different search strategies and databases. After screening, 28 papers were obtained and 7 papers were rejected as these articles did not meet the inclusion criteria. Besides, seven review papers also excluded at this stage. For the purpose of this review, only 11 papers have been accepted as shown in Table 2.

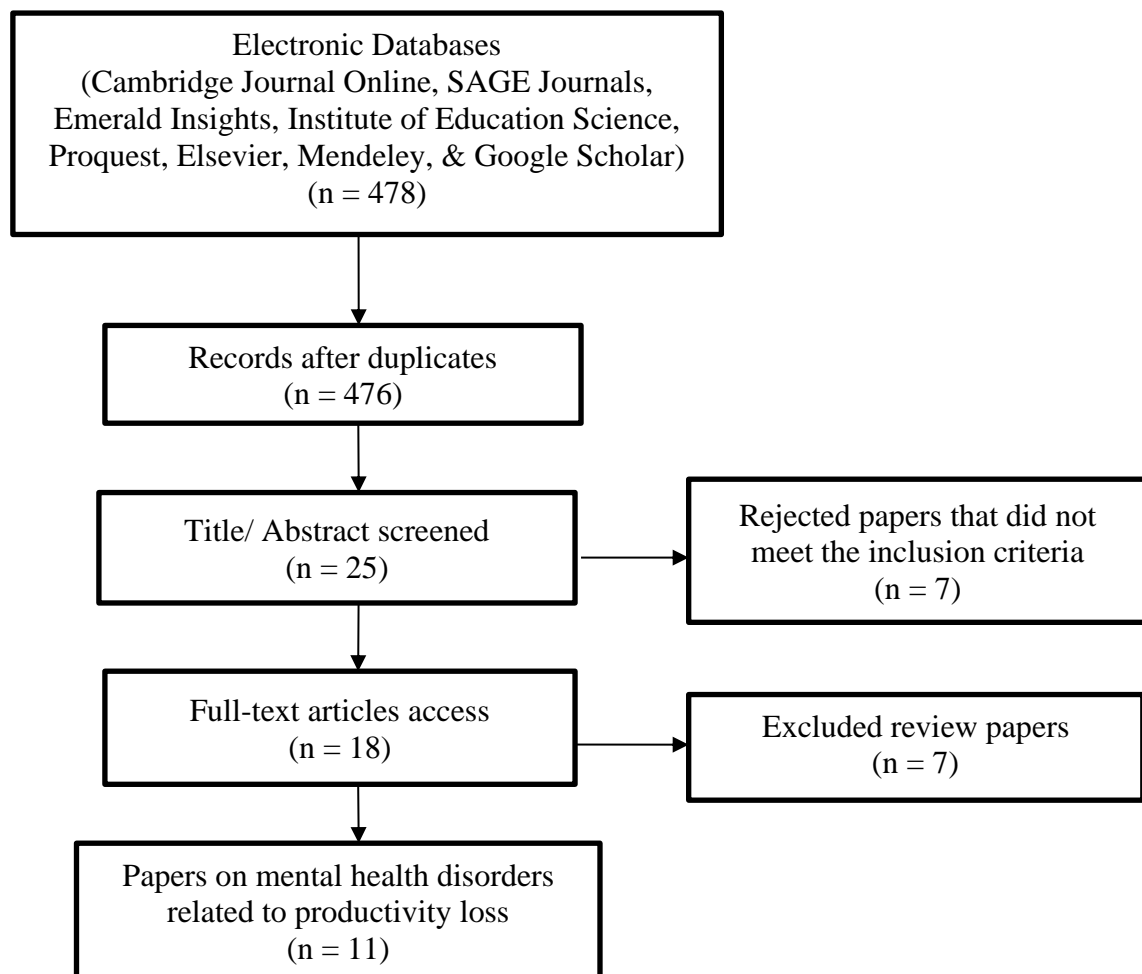


Figure 2. Flow Chart of Selection Process

3.0 Result

Overall, there are 14 papers selected in this study. Of that, eight papers relate to depression, three papers discussed both depression and anxiety, and the remaining papers relate to

schizophrenia. The findings on how this study analyses the issues of mental disorders in Malaysia are discussed based on the type of mental problem as shown in Table 2.

Table 2. Type of mental health disorders in Malaysia

Year	Author (s)	Types of Condition	Study Population	Ethnicity	Gender	Outcomes
2003	Mubarak et al.	Schizophrenia	174 schizophrenia patients in Penang	NA	Male Female	The schizophrenia patients experienced social isolation, encountered a problem like discrimination and exploitation in the workplace.
2003	Sherina, Nor Afiah, & Shamsul Azhar	Depression	210 patients in Butterworth Health Clinic, Penang	Malays Non-Malays	Male Female	The prevalence of depression among patients was 18% and the associated factors were female, single, lower education, and low income.
2004	Sherina, Rampal, & Mustaqim	Depression	223 respondent in Mukim Sepang, Selangor	Malay Chinese Indian Others	Male Female	The prevalence of depression among the elderly was 7.6% and employment status significantly found as associated factor of depression.
2005	Mubarak	Schizophrenia	258 of people with schizophrenia in the northern region of Malaysia	Malay Chinese Indian Others	Male Female	Approximately one-third of the respondents had perceived low quality of health in the areas of daily activities and work.
2009	Imran, Azidah, Asrenee, & Rosediani	Depression	244 elderly patients age 60 and over in outpatients clinic of	Malay Others	Male Female	The prevalence of depression among elderly patients was 13.9%.

Year	Author (s)	Types of Condition	Study Population	Ethnicity	Gender	Outcomes
			University Sains Malaysia Hospital			
2010	Din & Noor	Depression	487 women with current depressive symptoms in rural and urban areas	Malay	Female	The prevalence of current depression symptoms was higher rather than the prevalence of lifetime depression symptoms. The current depression symptoms were higher among urban women.
2011	Wong & Lua	Depression & Anxiety	520 respondents in East Coast Peninsular Malaysia	Malay Chinese Indian Others	Male Female	The prevalence of mild anxiety and depression was at 12.9% and 11.3% respectively. Gender and income were stated as associated factors.
2012	Sherina et al.	Depression	895 women that attending government primary care clinic in the state of Selangor	Malay Chinese Indian Others	Female	The prevalence of depression among women attending government primary care clinic was 12.1% and traumatic life events were associated with depression.
2013	Kaur, Tee, Ariaratnam, Krishnapillai, & China	Depression & Anxiety	2508 diabetes patients from primary care government clinics in the Klang Valley	Malay Chinese Indian	Male Female	The prevalence of depression and anxiety were 11.5% and 30.5% respectively.

Year	Author (s)	Types of Condition	Study Population	Ethnicity	Gender	Outcomes
2014	Siti Fatimah et al.	Depression	1556 of adults in the community of Selangor	Malay Chinese Indian Others	Male Female	The prevalence of depression was 10.3% and factors associated with depression were anxiety, a serious problem at workplace, financial constraint, and presence of chronic diseases.
2017	Teoh et al.	Schizophrenia	Schizophrenia's patients in Malaysia	Malay Chinese Indian Others	Male Female	There are 15,104 cases of schizophrenia and an estimated USD 100 million of the total economic burden that equivalent to 0.04% of the GDP. The mean cost per patient was USD 6594. Of that, 72% was indirect cost, 26% was direct medical care cost, and 2% was direct non-medical costs.

3.1 Depression

Depression is a common disorder but should not be overlooked due to its morbidity and burden and projected to be the second leading cause of disability worldwide in the year 2020 (Murray & Lopez, 1996). In Malaysia, depression is categorized as the most common mental disorders affecting approximately 2.3 million people (Mukhtar & Oei, 2011a, 2011b) and it became a popular topic in Malaysia. Many studies have been directed to examine the prevalence, risk factors, and effects of depression among different populations in Malaysia. Overall, eight papers are related to depression. The three of them were relate to depression among the elderly

as this disorder becomes a serious problem with significant morbidity and mortality. As projected the elderly population aged 60 years and above will reach 1.2 billion in this world by the year 2025 (Arokiasamy, 1997), it is vital to screen the elderly for depression to offer them the treatment needed. However, there are complexities in diagnosing depression among the elderly due to the presence of multiple medical problems. There are propensities health care providers miss the diagnosis and fail to give proper treatment as over 10% was recorded as undetected depression among the elderly (Imran et al., 2009). Depression among the elderly also may have significant clinical and social implications such as decreased quality of life and increase dependence on others. The factors associated with depression among the elderly addressed were unemployed, low family income, female, unmarried, no formal education, those living in the urban area, and those with have diseases that limit their daily life.

Another three papers were related to depression among women. Prior studies stated the prevalence of mental disorders mainly depression are higher among women compared to men. Normally, depression occurs in women age 25-44 years of age by reason of hormonal changes and social factors such as problems at work, and family responsibilities (Alexander, 2007). In Malaysia, depression among women was categorized as a high-risk group and primary care clinicians should concern about the prevalence and take these diseases into account when making diagnoses. In summary, factors associated with depression among women in Malaysia were traumatic life events, race, religion, miscarriage, education level, financial problems, family and relationship problems, history of serious illness, family history of mental disorders, and women living in the urban area.

The remaining two papers related to depression among adults and the urban poor. The prevalence of depression among adults was higher among those with chronic diseases compared to those without the chronic disease (Siti Fatimah et al., 2014). This study addressed the presence of anxiety and chronic diseases, serious problem at-work, serious family problems, serious financial problems, domestic violence, and low self-esteem as the associated risk factors among adults. Depression also has been examined among women in the urban poor in Malaysia. The study stated that the prevalence of depression and anxiety were more among urban women than men and among poor rather than non-poor urban (Almeida-Filho et al., 2004). Besides, the Institute for Public Health (2008) have reported that depression was more common among those women who stayed in urban areas with low income. The significant factors of this group in Malaysia were women under 25 years old, male, those who stayed more than four years in the area, and those who lack exercise (Tan & Yadav, 2013).

3.2 Depression and Anxiety

Depression and anxiety are two commons mental disorders. There is a growing awareness of the economic problems imposed by both disorder. Depression and anxiety also can severely affect the quality of life. These disorders may cause physical effects such as insomnia, restlessness, and loss of appetite. As depression is predicted to be the second leading contributor to disease burden by the year 2020 (Murray & Lopez, 1996), anxiety also may have similar adverse effects. However, the studies on anxiety are less known compared to depression

(Roy-Byrne et al., 2008). In this review, two papers mix the effect of depression and anxiety. While the remaining paper treat depression and anxiety independently. These papers are based on different communities such as in the rural areas, urban areas, and among breast cancer patients. In Malaysia, the effect of anxiety and depression among the populations was estimated at around 10% to 30% and mainly from those who live in the urban areas (Malaysia Psychiatric Association, 2006). A study by Wong and Lua (2011) explored the prevalence of depression and anxiety among rural communities on the east coast of Peninsular Malaysia and indicated the prevalence among rural folks was low. Besides, women with higher education backgrounds more likely to have these disorders. The mixed depression and anxiety also experienced among those with chronic diseases. Saniah and Zainal (2010) stated that breast cancer patients on chemotherapy experienced high-phase of depression and anxiety. Besides, the prevalence of depression and anxiety also found high among diabetic patients (Kaur et al., 2013).

3.3 Schizophrenia

Schizophrenia is one of the most serious and debilitating mental disorders with a huge impact on social and economic costs for several groups such as patients, caregivers, and society (Gustavsson et al., 2011). This disorder significantly affecting a person's thought processes and emotional responses due to disabling brain disorder. Hence, it may cause hallucinations, delusions, unorganized communication, and reduced motivation. According to Nakamura and Mahlich (2017), schizophrenia significantly relates to work impairment, reduces the quality of life, and lack of ability to perform daily activities.

Yet in Malaysia, there are only three studies on schizophrenia includes in this reviews. Of that, two papers examined the effect of chronic schizophrenia patients on the quality of life based on two different community groups. The findings of the study indicated that schizophrenia patients had serious decrements in the areas of social functioning and quality of the home environment such as experienced isolation, severe poverty, and discrimination and exploitation in the workplace (Mubarak, 2005; Mubarak et al., 2003). Another study by Teoh et al. (2017) explored the economic burden relate to schizophrenia. Despite the low prevalence of the disorder, it is a very debilitating and substantially attributed to productivity loss. In Malaysia, there are 15204 treated cases of schizophrenia in the year 2015 with the total economic costs of USD 100 million that equivalent to 0.04% of the national gross domestic product (GDP). The mean cost per patient was USD 6594. From the total costs of schizophrenia, 72 million was credited to indirect cost, 26 million was credited to direct medical cost, and 1.7 million was credited to direct non-medical cost.

4.0 Discussion

Mental disorders are become a worldwide issue and indicate around 12% part of the global burden disease. In the year 2020, 15% was accounted for disability-adjusted life-years lost due to these diseases. In this stage, Malaysia is not an exceptional case because mental health disorders are known as global burden diseases that shake the productivity and socio-economics circumstances of the country. Nowadays, mental disorders have been highlighted as serious issues due to the substantial increments of the prevalence year by year. Most of the prior studies in Malaysia only explored and examined the prevalence and associated risk factors of mental disorders regardless of looking from economic perspectives such as productivity loss. There is only one study that determined the economic burden of schizophrenia (Teoh et al., 2017), while the remaining studies only mentioned the issue of productivity loss, work impairment, and

potential revenue lost due to mental health disorders (Chong, Vaingankar, Abdin, & Subramaniam, 2013; Hassan et al., 2018; Mukhtar & Oei, 2011a). Hence, there is a serious need for future research in this country to enlighten these issues of productivity loss due to mental health disorders as it give impact on the economic burden.

5.0 Conclusion and recommendation

This paper reviews and understand the past studies on the mental disorder as it may affect every part of an individual's life such as physical health, career, and social life. The findings of this study clearly stated that there is a limited study on mental health disorders that relates to productivity loss among workers even the issue has become a major cause of productivity loss worldwide. Hence, there is a vital need for government, employer, and society to highlights and bring up the issues of mental disorder on productivity among workers as country agenda. It is due to the future projection trend on the prevalence of mental health disorders as it is estimated to increase because of an increase in life expectancy (ageing population) and exacerbation of social and economic problems.

Declaration

Authors declare that this manuscript is original, has not been published before, and is not currently being considered for publication elsewhere. We know of no conflicts of interest associated with this publication, and there has been no significant financial support for this work that could have influenced its outcome. As Corresponding Author, I confirm that the manuscript has been read and approved for submission by all the named authors.

Authors' contribution (if more than one author)

Author 1: Design the study and wrote the paper with input from all authors.

Author 2: Contributes to the design and writing of the paper.

Author 3: Contributes to the design and analysis of the paper.

References

- Alexander, J. L. (2007). Quest for timely detection and treatment of women with depression. *Journal of Managed Care Pharmacy*, 13(9 SUPPL. A), S3–S11. Retrieved from www.amcp.org
- Almeida-Filho, N., Lessa, I., Magalhães, L., Araújo, M. J., Aquino, E., James, S. A., & Kawachi, I. (2004). Social inequality and depressive disorders in Bahia, Brazil: Interactions of gender, ethnicity, and social class. *Social Science and Medicine*, 59(7), 1339–1353. <https://doi.org/10.1016/j.socscimed.2003.11.037>
- Arokiasamy, J. T. (1997). Malaysia's ageing issues. *Medical Journal of Malaysia*, 52(3), 197–201.
- Berndt, E. R., Bailit, H. L., Keller, M. B., Verner, J. C., & Finkelstein, S. N. (2000). Health care use and at-work productivity among employees with mental disorders. *Health Affairs*, 19(4), 244–256. <https://doi.org/10.1377/hlthaff.19.4.244>
- Bielecky, A., Chen, C., Ibrahim, S., Beaton, D. E., Mustard, C. A., & Smith, P. M. (2015). The impact of co-morbid mental and physical disorders on presenteeism. *Scandinavian Journal*

- of Work, Environment & Health, 41(6), 554–564. <https://doi.org/10.5271/sjweh.3524>
- Burton, W. N., Schultz, A. B., Chen, C.-Y., & Edington, D. W. (2008). The association of worker productivity and mental health: a review of the literature. *International Journal of Workplace Health Management*, 1(2), 78–94. <https://doi.org/10.1108/17538350810893883>
- Chong, S. A., Vaingankar, J. A., Abdin, E., & Subramaniam, M. (2013). Mental disorders: employment and work productivity in Singapore. *Social Psychiatry and Psychiatric Epidemiology*, 48(1), 117–123. <https://doi.org/10.1007/s00127-012-0526-5>
- Cloutier, M., Greene, M., Guerin, A., Touya, M., & Wu, E. (2018). The economic burden of bipolar I disorder in the United States in 2015. *Journal of Affective Disorders*, 226, 45–51. <https://doi.org/10.1016/j.jad.2017.09.011>
- Cole, M. A., & Neumayer, E. (2006). The impact of poor health on total factor productivity. *The Journal of Development Studies*, 42(6), 918–938. <https://doi.org/http://dx.doi.org/10.1080/00220380600774681>
- Collins, J. J., Baase, C. M., Sharda, C. E., Ozminkowski, R. J., Nicholson, S., Billotti, G. M., ... Berger, M. L. (2005). The assessment of chronic health conditions on work performance, absence, and total economic impact for employers. *Journal of Occupational and Environmental Medicine*, 47(6), 547–557. <https://doi.org/10.1097/01.jom.0000166864.58664.29>
- Din, M. O., & Noor, N. M. (2010). Prevalence and Factors Associated with Depressive Symptoms in Malay Women. *Women & Health*, 49(8), 573–591. <https://doi.org/10.1080/03630240903495897>
- Evans-Lacko, S., & Knapp, M. (2016). Global patterns of workplace productivity for people with depression: absenteeism and presenteeism costs across eight diverse countries. *Social Psychiatry and Psychiatric Epidemiology*, 51(11), 1525–1537. <https://doi.org/10.1007/s00127-016-1278-4>
- Goetzel, R. Z., Long, S. R., Ozminkowski, R. J., Hawkins, K., Wang, S., & Lynch, W. (2003). The health and productivity cost burden of the “top 10” physical and mental health conditions affecting six large U.S. employers in 1999. *Journal of Occupational and Environmental Medicine*, 45(1), 5–14. <https://doi.org/10.1097/00043764-200301000-00007>
- Greenberg, P. E., Kessler, R. C., Birnbaum, H. G., Leong, S. A., Lowe, S. W., Berglund, P. A., & Corey-Lisle, P. K. (2003). The economic burden of depression in the United States. *The Journal of Clinical Psychiatry*, 64(12), 1465–1475. <https://doi.org/10.4088/JCP.v64n1211>
- Guan, N. C. (2014). A review of depression research in Malaysia. *Medical Journal of Malaysia*.
- Gustavsson, A., Svensson, M., Jacobi, F., Allgulander, C., Alonso, J., Beghi, E., ... Olesen, J. (2011). Cost of disorders of the brain in Europe 2010. *European Neuropsychopharmacology*, 21(10), 718–779. <https://doi.org/10.1016/j.euroneuro.2011.08.008>
- Hassan, M. F., Hassan, N. M., Kassim, E. S., & Hamzah, M. I. (2018). Issues and Challenges of Mental Health in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 8(12), 1686–1696. <https://doi.org/10.6007/ijarbss/v8-i12/5288>
- Hilton, M. F., Scuffham, P. a, Vecchio, N., & Whiteford, H. a. (2010). Using the interaction of mental health symptoms and treatment status to estimate lost employee productivity. *The Australian and New Zealand Journal of Psychiatry*, 44(June 2009), 151–161. <https://doi.org/10.3109/00048670903393605>
- Imran, A., Azidah, A. K., Asrenee, A. R., & Rosediani, M. (2009). Prevalence of depression and its associated factors among elderly patients in outpatient clinic of Universiti Sains Malaysia Hospital. *The Medical Journal of Malaysia*, 64(2), 134–139. Retrieved from

- <http://www.ncbi.nlm.nih.gov/pubmed/20058573>
Institute for Public Health. (2008). Depression. Retrieved September 13, 2020, from <http://iku.moh.gov.my/nhms>
- Jamaiyah H. (2000). Community mental health in Malaysia: Marriage of psychiatry and public health. *Buletin Kesihatan Masyarakat Isu Khas*, 155–166.
- Johns, G. (2010). Presenteeism in the workplace: A review and research agenda. *Journal of Organizational Behavior*, 31(4), 519–542. <https://doi.org/10.1002/job.630>
- Kaur, G., Tee, G. H., Ariaratnam, S., Krishnapillai, A. S., & China, K. (2013). Depression, anxiety and stress symptoms among diabetics in Malaysia: a cross sectional study in an urban primary care setting. *BMC Family Practice*, 14(1), 69. <https://doi.org/10.1186/1471-2296-14-69>
- Kessler, R. C., Barber, C., Birnbaum, H. G., Frank, R. G., Greenberg, P. E., Rose, R. M., ... Wang, P. (1999). Depression in the workplace: Effects on short-term disability. *Health Affairs*, 18(5), 163–171. <https://doi.org/10.1377/hlthaff.18.5.163>
- Kessler, R. C., & Frank, R. G. (1997). The impact of psychiatric disorders on work loss days. *Psychological Medicine*, 27(4), 861–873. <https://doi.org/10.1017/S0033291797004807>
- Krishnaswamy, S., Subramaniam, K., Jemain, A. A., Low, W. Y., Ramachandran, P., Indran, T., & Patel, V. (2012). Common mental disorders in Malaysia: Malaysian mental health survey, 2003-2005. *Asia-Pacific Psychiatry*, 4(3), 201–209. <https://doi.org/10.1111/j.1758-5872.2012.00180.x>
- Laitinen-krispijn, S., & Bijl, R. V. (2000). Mental disorders and employee sickness absence : the NEMESIS study. *Soc Psychiatry Psychiatr Epidemiol*, 35(2), 71–77. <https://doi.org/10.1007/s001270050010>
- Lim, D., Sanderson, K., & Andrews, G. (2000). Lost productivity among full-time workers with mental disorders. *The Journal of Mental Health Policy and Economics*, 3(3), 139–146. <https://doi.org/10.1002/mhp.93>
- Lofland, J. H., Pizzi, L., & Frick, K. D. (2004). A review of health-related workplace productivity loss instruments. *Pharmacoeconomics*, 22(3), 165–184. <https://doi.org/10.2165/00019053-200422030-00003>
- Malaysia Psychiatric Association. (2006). Depression and Anxiety. Retrieved September 2, 2020, from <https://www.psychiatry-malaysia.org/>
- Marcellusi, A., Fabiano, G., Viti, R., Francesa Morel, P. C., Nicolò, G., Siracusano, A., & Mennini, F. S. (2018). Economic burden of schizophrenia in Italy: a probabilistic cost of illness analysis. *BMJ Open*, 8(2), e018359. <https://doi.org/10.1136/bmjopen-2017-018359>
- McCunney, R. J. (2001). Health and productivity: A role for occupational health professionals. *Journal of Occupational and Environmental Medicine*, 43(1), 30–35. <https://doi.org/10.1097/00043764-200101000-00007>
- Mubarak, A. R. (2005). Social functioning and quality of life of people with schizophrenia in the northern region of Malaysia. *Advances in Mental Health*, 4(3), 200–209. <https://doi.org/10.5172/jamh.4.3.200>
- Mubarak, A. R., Baba, I., Chin, L. H., & Hoe, Q. S. (2003). Quality of life of community-based chronic schizophrenia patients in Penang, Malaysia. *Australian and New Zealand Journal of Psychiatry*, 37(5), 577–585. <https://doi.org/10.1046/j.1440-1614.2003.01228.x>
- Mukhtar, F., & Oei, T. P. S. (2011a). A Review on the Prevalence of Depression in Malaysia. *Current Psychiatry Reviews*, 7, 0–0. Retrieved from <https://drfircbt.files.wordpress.com/2014/09/prevalence-of-depression-cpr.pdf>
- Mukhtar, F., & Oei, T. P. S. (2011b, July 24). A review on assessment and treatment for depression in malaysia. *Depression Research and Treatment*. Hindawi. <https://doi.org/10.1155/2011/123642>

- Murray, C. J. L., & Lopez, A. D. (1996). *The global burden of disease: a comprehensive assessment of mortality and disability from deceases, injuries and risk factors in 1990 and projected to 2010*. Harvard University Press (Vol. 1). <https://doi.org/10.1186/1471-2458-13-863>
- Nakamura, Y., & Mahlich, J. (2017). Productivity and deadweight losses due to relapses of schizophrenia in Japan. *Neuropsychiatric Disease and Treatment*, *13*, 1341–1348. <https://doi.org/10.2147/NDT.S138033>
- National Health and Morbidity Survey. (2019). Institute for Public Health - NHMS. Retrieved August 30, 2020, from <http://www.iku.gov.my/nhms/>
- National Institute of Mental Health. (2020). National Institute of Health. Retrieved August 19, 2020, from <https://www.nimh.nih.gov/health/topics/anxiety-disorders/index.shtml>
- Roy-Byrne, P. P., Davidson, K. W., Kessler, R. C., Asmundson, G. J. G., Goodwin, R. D., Kubzansky, L., ... Stein, M. B. (2008). Anxiety disorders and comorbid medical illness. *General Hospital Psychiatry*, *30*(3), 208–225. <https://doi.org/10.1016/j.genhosppsych.2007.12.006>
- Saniah, A. R., & Zainal, N. Z. (2010). Anxiety, depression and coping strategies in breast cancer patients on chemotherapy. *Malaysian Journal of Psychiatry*, *19*(2), 1–6. Retrieved from <https://www.mjpsychiatry.org/index.php/mjp/article/viewFile/99/91>
- Schultz, A. B., & Edington, D. W. (2007). Employee health and presenteeism: A systematic review. *Journal of Occupational Rehabilitation*, *17*(3), 547–579. <https://doi.org/10.1007/s10926-007-9096-x>
- Scott, M. (2005). *Mental Health and Productivity in the Workplace: A Handbook for Organizations and Clinicians*. *Psychiatric Services* (Vol. 56). American Psychiatric Publishing. <https://doi.org/10.1176/appi.ps.56.1.110>
- Sherina, M., Nor Afiah, M., & Shamsul Azhar, S. (2003). Factors associated with depression among elderly patients in a primary health care clinic in Malaysia. *Asia Pacific Family Medicine Blackwell Science*, *2*(3), 148–152. <https://doi.org/10.1046/j.1444-1683.2003.00080.x>
- Sherina, M., Rampal, L., & Azhar, M. (2008). The prevalence of depressive symptoms and potential risk factors that may cause depression among adult women in selangor. *Malaysian Journal of Psychiatry*, *17*(2), 64–72. Retrieved from <https://www.mjpsychiatry.org/index.php/mjp/article/view/42>
- Sherina, M. S., Arroll, B., Goodyear-Smith, F., & Rozali, A. (2012). Prevalence of depression among women attending a primary urban care clinic in Malaysia. *Singapore Medical Journal*, *53*(7), 468–473. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/22815016>
- Sherina, M. S., Rampal, L., & Mustaqim, A. (2004). The Prevalence of Depression Among the Elderly in Sepang, Selangor. *Medical Journal of Malaysia*, *59*(1), 45–49. Retrieved from <http://www.e-mjm.org/2004/v59n1/Depression.pdf>
- Siti Fatimah, K. M., Sherina, M. S., Lekhraj, R., & Firdaus, M. (2014). Prevalence, associated factors and predictors of depression among adults in the community of Selangor, Malaysia. *PLoS ONE*, *9*(4), e95395. <https://doi.org/10.1371/journal.pone.0095395>
- Stephens, T., & Joubert, N. (2001). The economic burden of mental health problems in Canada. *Chronic Diseases in Canada*, *22*(1), 18–23.
- Tan, K. L., & Yadav, H. (2013). Depression among the urban poor in Peninsular Malaysia: A community based cross-sectional study. *Journal of Health Psychology*, *18*(1), 121–127. <https://doi.org/10.1177/1359105311433908>
- Teoh, H. (2010). A survey of urban child and adolescent mental health problems in an urban Malaysian population. *Malaysian Psychiatric Association*, *19*(1), 15–27.
- Teoh, S. L., Chong, H. Y., Aziz, S. A., Chemi, N., Othman, A. R., Zaki, N. M., ...

- Chaiyakunapruk, N. (2017). The economic burden of schizophrenia in Malaysia. *Neuropsychiatric Disease and Treatment*, 13, 1979–1987. <https://doi.org/10.2147/NDT.S137140>
- Thomas, C. M., & Morris, S. (2003). Cost of depression among adults in England in 2000. *British Journal of Psychiatry*, 183(Dec.), 514–519. <https://doi.org/10.1192/bjp.183.6.514>
- Vaingankar, J. A., Subramaniam, M., Chong, S. A., He, V. Y. F., Abdin, E., Picco, L., ... Chia, S. E. (2015). Prevalence of chronic mental and physical disorders, impact on work productivity and correlates of alcohol use disorders and nicotine dependence across occupations. *Annals Academy of Medicine Singapore*, 44(4), 133–144. Retrieved from <http://www.annals.edu.sg/p>
- Wang, P. S., Beck, A., Berglund, P., Leutzinger, J. A., Pronk, N., Richling, D., ... Kessler, R. C. (2003). Chronic medical conditions and work performance in the health and work performance questionnaire calibration surveys. *Journal of Occupational and Environmental Medicine*, 45(12), 1303–1311. <https://doi.org/10.1097/01.jom.0000100200.90573.df>
- Wee, L. H., Lay, L., Yeap, L., Mei, C., Chan, H., Wong, J. E., ... Siau, C. S. (2019). Antecedent factors predicting absenteeism and presenteeism in urban area in Malaysia. *BMC Public Health*, 19(4), 1–12. <https://doi.org/10.1186/s12889-019-6860-8>
- Wong, S. Y., & Lua, P. L. (2011). Anxiety and Depressive Symptoms among Communities in the East Coast of Peninsular Malaysia : A Rural Exploration. *MJP Online Early*, 22(1), 22–29. Retrieved from http://www.psychiatry-malaysia.org/file_dir/2840233504df5c38c89be0.pdf
- World Health Organization. (2004). *Promoting mental health: Concept, Emerging Evidence, and Practice Summary Report*. Geneva.
- Zhang, W., Bansback, N., & Anis, A. H. (2011). Measuring and valuing productivity loss due to poor health: A critical review. *Social Science & Medicine*, 72(2), 185–192. <https://doi.org/10.1016/j.socscimed.2010.10.026>