A Mixed Method Study Protocol on Contributing Factors of Depression among Adults Inmates in a Local Prison Malaysia

Gunenthira Rao, Halimatus Sakdiah Minhat, Hayati Kadir Sahar, Firdaus Mukhtar

A Mixed Method Study Protocol on Contributing Factors of Depression among Adults Inmates in a Local Prison Malaysia

Gunenthira Rao[1,2], Halimatus Sakdiah Minhat[2], Hayati Kadir Sahar[2], Firdaus Mukhtar[3]

[1]Ministry of Health, Malaysia, [2]Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia, [3]Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia

Abstract
Mental health is a global public health concern. Living in institutions, including imprisonment, make the inmates susceptible to depression. The objective of this research is to determine and explore the contributing factors of depression among adult prison inmates in a Malaysian local prison. The study utilizes the explanatory sequential mixed method approach. In the first phase, the quantitative hypothesis will be used to address the association between depression and biological, psychological, and social factors among the respondents. It will use a validated questionnaire from approximately 456 inmates using random sampling which was constructed based on the Biopsychosocial theory. The level of depression will be measured using the Center for Epidemiology Study Depression Scale (CES-D). In the second phase, in-depth interviews will be steered among depressed inmates recognized through purposive sampling. Univariate, bivariate and multivariate analyses will be used in quantitative statistics, meanwhile, the qualitative phase encompass a series of in-depth interviews where it will be discontinued once the saturation point is attained. The content of the interviews will be recorded and transcribe verbatim using thematic analysis. It is anticipated this study will enlighten the causative factors of depression and will gratify a novel modality to reduce depression.
Keywords: Depression, Inmates, Prison, Adult, Mixed Method.

Introduction
Prison is an institution intended as a sentence for individuals who had run afoul against the law. It is an establishment to punish individual who acquainted with delinquencies, safeguard the community from crimes, and transform them into law abiding residents, thus reduce re-offending (Armour et al, 2012). Besides that, prison also serve as a rehabilitation center to change inmates into a better person through educational courses in prison, teaching job skills, religious activity and counselling services. However it has been conclusively shown that incarceration increases

vulnerabilities and exacerbates mental health problems (Armour, 2012). This contributed to the fact that inmates were among the underprivileged and stigmatized persons in the community. Alongside physical health issues, many suffer from mental illnesses too (Unver, Yuce, Bayram, & Bilgel, 2013. Epidemiological studies conducted across many regions have described that the prevalence of mental health problem in jail far surpasses the general population (Beyen, Dadi, Dachew, Muluneh, & Bisetegn, 2017).

The imprisonment experiences have led to the development of many mental illness including anxiety, depression, self-harming, obsessions, and suicide (Nwaopara & Stanley, 2015). Depression is common illness among prison population as it is associated with imprisonment experiences (Kamoyo et al, 2015). According to Diagnostic and Statistics Manual of Mental Disorders V, depression is recognized by the existence of five or more symptoms of impatient, apathy, changes in sleep and daily routine, loss of vigor, guiltiness, suicidality and loss of attentiveness for a duration of two weeks and characterized by a variation from earlier functioning, with at least one of the indication of depressed mood or loss of concentration or pleasure (American Psychiatric Association, 2013). Meanwhile World Health Organization defined, depression as a mental problem that accompany with depressed mood, loss of interest, reduced energy, guiltiness, troubled sleep or appetite (WHO, 2012). These difficulties can be chronic or recurring and may lead to considerable impairments in an individual's ability to take care of their daily routines. At worst case scenario, depression can be ended up with suicide. Virtually one million lives are lost annually due to suicide, which interprets to 3000 suicidal deaths on a daily basis. For every individual who commit suicide, 20 or more may endeavor to end their life (WHO, 2012). The demand to curb depression and associated mental health problems is augmenting worldwide (WHO, 2012).

In Malaysia, depression is one of common mental health problem (Mukhtar & Oei, 2011). A comparison study of depression and stress between men and women recidivist in peninsular Malaysia reported that depression is a common mental health issues among prison populations as it is associated with imprisonment experiences. It was reported that from the 426 inmates respondents, 236 (55.4%) were having depression with 92 (40.5%) were men and 144 (72.4%) were women (Ahmad & Mazlan, 2014). Comparatively, a cross-sectional study among 225 convicts from the Kajang integrity and juvenile detention center in the Kajang prison noticed that 38 (16.9%) of the young recidivists had depression (Baharuddin, Yusof, Akhtar, Jaafar, & Zakaria, 2013).

The mental health of prisoners especially depression cannot be left alone unaddressed. It have an impacts one society, as most of the inmates will return to the community at some point. This inmates should be adequately prepared for resettlement and that the risk of recidivism should be addressed. Literature have reported that mental health disorder can be a predictor of recidivism (Hakansson & Berglund, 2012). The government through various organizations have given much attention to improve mental health among the inmates through designated mental health policy and interventional programme, but the depression problem still persist. One of the cause might be due to limited empirical data on contributing factor towards depression among

the inmates especially in Malaysia. Therefore, this present study aimed to study the contributing factors of depression among adults in a local prison inmates in Malaysia.

Methods
Study Design
This research will adopt mixed method approach involving quantitative and qualitative study. Mixed method is a form of study in which the researcher combines both elements of quantitative and qualitative approach in a solitary research for the purposes of breadth and depth of the subject being studied (Johnson, Onwuegbuzie, & Turner, 2004). Author Creswell (2013) described mixed methods as a research method which is popular in the field of social, behavioral, or health sciences, in which the investigators gather, analyze, and incorporate both quantitative and qualitative data into single study to address the study problems (Creswell, 2013). Such form of study which combine two into one, deliver an enhanced understanding of a research problem rather than single method alone.

Settings
The study will be conducted in one of the 38 prisons organizations under the management of the prison department of Malaysia.

Sample Size
The sample size for this study was calculated using a formula by Lwanga and Lemeshow, (1991). $n=(2\sigma2[Z1−\alpha/2+Z1−\beta]2)/([\mu1−\mu2]2)$. Using a power of 80%, a confidence interval of 95%, the calculated sample size was estimated to be 194 responded. Additional adjustment were considered in computing the sample size (Aday & Cornelius, 2006) which taking into consideration adjustment for comparison between two groups and expected response rate 85% (Nwaopara & Stanley, 2015), the final sample size calculated was 456 participants.

Inclusion and Exclusion Criteria
The inclusion criteria for this research are adults aged 21 years old, sentenced prisoners who have been convicted by the court regardless of crime and able to comprehend national language Bahasa Melayu or English. Potential inmates will be excluded if they are foreigners, inmates sentenced to life imprisonment or on death row, inmates who had prior diagnosis or under treatment for mental illness and those inmates categorized as high risk by prison authority.

Sampling Population
The sampling population are the adult inmates in the selected prison who fulfill the above inclusion criteria. Sampling unit would be an adult inmate in prison. The sampling population in qualitative phase are the adult inmates in the prison who identified as depress based on the Centre for Epidemiological Study Depression Scale (CES-D) in the quantitative approach.

Sampling Methods
Stratified proportional random sampling will be applied to identify the respondents in quantitative study in phase one. Based on the sample size estimation calculated, the inmates will be selected proportionately according to division of prison which are orientation, character

building, skill development and pre-release. The division of prison will be the strata. Within each division of strata, the sample of prisoners will be selected by simple random sampling using table of random numbers. The sampling method in phase two will be purposive sampling among those who were identified to be depressed from phase one.

Data Collection
Data will be collected using a pre-tested and validated questionnaire in a cross sectional study which embody phase one of study. The questionnaire available both in Malay and English to accommodate inmate's language preference.

In-depth interviews will be used in qualitative phase of study. It will be based on significant contributing factors identified from the phase one according to the BPS model. The main drive of in-depth interviews is to support the findings of the quantitative study and further explore any other issues which were not assessed earlier. An interview guide will be developed following the analysis of quantitative study to guide the researcher. Using in-depth interviews offer the opportunity for researcher asks open-ended questions orally. This research method is useful to capture descriptive data about people's behaviors', attitudes, unfolding complex issue and reveal views of the population under study. Extensive interviews are worthwhile if we want inclusive insight about an individual's feelings and comportments or want to discover something novel in detail (Boyce & Neale, 2006). In depth interview has its own advantages compared to other research method. It creates an in-depth understanding on the questions being studied and it is flexible. This is useful particularly in social health study like mental health which deals with complex issue

The interview will be discontinued once the saturation point is reached for factors that will be explored. These factors will be identified from the statistical analysis conducted in the quantitative study. The term data saturation point generally denotes to the process of collecting and analyzing information's until the point where there no new insights being observed (Talent el al, 2016).

Instruments
The questionnaire developed in this study was based on Bio psychosocial Model by American psychiatrist named George Engel which states that in order to understand mental illness like depression, one must take into account the influence of biological, psychological and social factors. Questionnaire mainly consists of six sections which are:

Part A: Biological Factors
Includes biological influence on health which are age, presence of chronic medical illness, and number of children.

Part B: Psychological Factor
Psychological or behavioral component that contributes to the patient's condition and have an impact on medical wellbeing. Inmates will be asked on history of smoking, alcohol, substance abuse which were given options to answer yes or no.

Part C: Social Factors
Social factors examines depression from sociological perspective which includes history of childhood abuse, history of childhood labor, presence of prison visitor, present offence, imprisonment duration, previous imprisonment, work task performed in prison, religious practice, education level, ethnicity, marital and employment history.

Part D: Cohen's Perceived Stress Scale (PSS)
PSS will use validated questionnaire developed by Cohen, Kamarck, and Mermelstein (1983). It is one of the most used psychometric instruments to measure stress. The Malay translated version was developed and validated by Mazlan & Ahmad (2014) among prisoners which has good reliability. The PSS is made of ten positive and negative statements using five-point Likert scale (never, almost never, sometimes, fairly often, and very often). The overall score is computed by totaling the sum of all questions which reverse coding will be used for negative questions. An inmates can have a scores between zero and 40, higher score indicates more stress. The mean cumulative score will be used as bench mark to categorize into perceived high or low stress.

Part E: Rosenberg Self-esteem Scale (RSES)
There 10 questions that measures individual self-assurance using both positive and negative state of mind allied to ourselves (Rosenberg M, 1965). All items need to be responded using Likert scale which the choices are strongly agree, agree, unsure, disagree and strongly disagree. The scale has a range of scores between 0 and 50 which can be calculated by the sum scores for all ten items in a continuous scale. Reverse coding required for negative questions and higher scores designate higher self-esteem. The mean score of all items will be used as a bench mark to categorize high and low self-esteem. The validated Malay versions of RSES will be used as well in this study (Jamil, 2006)

Part F: Center for Epidemiologic Studies Depression Scale (CESD)
CESD will be applied to determine the presence of depression it contains 20 questions and 4-point Likert scale ranging from rarely, sometimes, occasionally or most of the time. The statements are associated with some depression symptoms such as food aversion, restlessness, defocus and others. It will adapt original English version of CES-D designed by Radloff (1977). The Malay version will use a validated and pre-tested instrument in local prison in Malaysia and have a good validity and reliability (Mazlan & Ahmad, 2014). The total score is the sum of the item's scale for negative and positive statements. The average score of all the questions will be used as a bench mark to categorize into inmates with depression and without.

Data Analysis
Statistical Package for the Social Sciences (SPSS) software version 22 will be engaged for statistical analysis. Descriptive statistics would be used for continuous variable in the form of mean, and standard deviation. Categorical data will be reported in frequencies, range, and percentage. Inferential statistic involving Chi-Square will be used to see association between two categorical variables. While multiple logistic regression data will be presented as adjusted OR and 95% CI. Statistical test with a p value of less than 0.05 will be documented significant.

In the qualitative phase, the data will be analyzed by means of thematic analysis (TA) which commonly used in qualitative studies (Javadi & Zarea, 2016). Braun and Clarke (2006) delineate TA as a technique for classifying, analyzing, and reporting arrays (themes) within data. The drive of it is to recognize patterns of dataset that respond to the research question being addressed. Data analysis for this research will be based on Braun and Clarke's (2006) article on using thematic analysis in psychology. The approach to TA comprises a six-phase progression which are acquaintance of data coding, probing for themes, revising themes, outlining and naming themes and writing up. (Braun & Clarke, 2006).

Ethics Approval
This research was permitted by university research ethics committee of Universiti Putra Malaysia on Mei 19, 2017 (Reference No: FPSK-P031-2017) and Malaysian prison committee board. The study is registered in the Malaysian National Medical Research Registry (NMRR-17-2115-37998). Preceding to data collection, a briefing will be carried among the inmates briefing the objectives and methodology of the study. Respondents' written consent will be attained before sampling commenced. The outcomes of the study will be submitted to the prison authorities for further action.

Results
By the time the manuscript was published, data collection should have commenced. The results are expected to be published the following year. The findings from this study will make several noteworthy contribution to the inmates' population in Malaysia. This study could provide baseline information related to the prevalence of depression among the adults prisoners in Malaysia and the contributing factors. Thus, acknowledging the severity of the issue for further actions. The outcomes of this study can be capitalized as a guideline in reviewing strategic plan related to depression and serve as a guidance for future intervention program as contributing factors towards depression has been identified. It will assist the relevant authorities and stakeholders to plan and implement any programs to improve the general well-being and mental health of the inmates and thus reducing the occurrence of depression.

Discussion
Mixed method approach used in this study is to address diverse questions of research question that need to be comprehensive (O'Cathain, Murphy, & Nicholl, 2007). During the in-depth interviews under qualitative phase, researchers' discussion with the respondent will confirm and elaborate some of the findings in quantitative phase. Interviewees cited comprehensiveness set as a powerful strength to use of mixed methods approach to report a variety of questions and acquire an extensive picture of a subject being studied. An inclusive methodology was seen as obligatory in line with the complexity of issues in understanding the contributing factors of depression among the inmates. Additionally, mixed methods serve as complementary to the power of both qualitative and quantitative study design as it use different methods to address same research questions.

There many types of mixed method study, in this sequential explanatory design will be applied. It comprises of two separate stages, which quantitative trailed by qualitative (Creswell, Plano

Clark, et al., 2003). Initially researcher gathers and analyzes the quantitative numeric data which recognized as first phase. The qualitative text data are gathered and explored in next stage of study in sequence. The drive of doing so is to support and strengthen the quantitative results gathered in the first phase of study. The qualitative, which is second phase constructs on the earlier quantitative phase. The justification for such methodology is that the quantitative data and their succeeding analysis deliver a better understanding of the problem statement identified. The decision which quantitative results need to be further described will be determined conclusively once the quantitative phase is accomplished. But the choices are, selecting significant results or strong predictors. The qualitative analysis enhance and explicate results by exploring inmates' views in more detail (Rossman & Wilson, 1985; Tashakkori & Teddlie, 2003; Creswell, 2003).

Point of interface is a point where the two strands of data are connected. Connection of data happens when the analysis of one form of data point toward the need for the supplementary data. In this study, sequential explanatory design will be used and the point of interfaces will be during the data collection which quantitative results build to the subsequent collection of qualitative data. In explanatory design, quantitative data are accentuated and the second phase is linked to the outcomes of the first phase.

This research was undertaken because there high prevalence of mental health problems among imprisoned inmates (Constantino, Assis, & Pinto, 2016). Secondly, increasing number of prison inmates may lead to more mental health related problems. The world prison populace has grown up by virtually 20% which is somewhat above the projected 18% increase in the world's general population compared to year 2000 (Walmsley, 2013). Similarly, Malaysia also registered increasing trend of prison population. Thirdly, depression contributes to the global burden of disease and distresses individuals throughout the world. The World Health Organization (WHO) has categorized depression as the 4th leading cause of disability globally and foresees that by 2020, it will be the second foremost cause of disability (Kessler & Bromet, 2013). The burden of depression poses a great public health challenge, both at the social and economic levels. Across the nation, it imposes a significant economic burden not only to the depressed individuals but also to their families, communities, employers, and indirectly effects the health care systems and government budgets (WHO, 2012). Fourthly, there is paucity of local data related to prevalence and determinants of depression among adult inmates of prisons in Malaysia as most studies focusing on young adult groups or particular gender specifically. This provoked the interest to do a local study on contributing factors of depression among adult inmates in local prison. However mixed method approach was chosen as it is more appropriate study design.

Corresponding Author
Associate Professor Halimatus Sakdiah Minhat

Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
Email: halimatus@upm.edu.my

References

American Psychiatric Association. (2013). Diagnostic and Statistical Manual of Mental Disorders, 5th Edition.

Armour, C. (2012). Mental health in prison: A trauma perspective on importation and deprivation. *International Journal of Criminology and Sociological Theory, 5(2).*

Kessler, R. C., & Bromet, E. J. (2013). The epidemiology of depression across cultures. Annual review of public health, 34, 119.

World Health Organization. (2012). Depression: A Global Crisis. World Mental Health Day, October 10 2012. Occoquan: World Federation for Mental Health; 2012. Accessed Dec, 3, 2017.

Ahmad, A., & Mazlan, N. (2014). Stress and Depression: A Comparison Study between Men and Women Inmates in Peninsular Malaysia. *International Journal of Humanities and Social Science, 4(2).*

Constantino, P., Assis, S. G. D., & Pinto, L. W. (2016). The impact of prisons on the mental health of prisoners in the state of Rio de Janeiro, Brazil. Ciência & Saúde Coletiva, 21(7), 2089-2100.

Creswell, J. W. (2003) Research design: Qualitative, quantitative, and mixed methods approaches (2nd edn). Thousand Oaks CA: *Sage Publications*

Johnson, B. R., and Onwuegbuzie, A. J. (2004) Mixed methods research: A research paradigm whose time has come, Educational Researcher 33(7): 14–26.

Tashakkori, A., and Teddlie, C. (eds.) (2003) Handbook of Mixed Methods in Social and Behavioral Research,Thousand Oaks CA: Sage Publications Mertens DM (2005) Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative and mixed-methods (2nd edition).

Talent, I. Y. W. H. (2016). To what extent should data saturation be used as a quality criterion in qualitative research?

Nwaopara, U., & Stanley, P. (2015). Prevalence of Depression in Port Harcourt Prison. *Journal of Psychiatry, 2015.*

Walmsley, R. (2013). World prison population list: Home Office London,, England.

Boyce, C., & Neale, P. (2006). Conducting in-depth interviews: A guide for designing and conducting in-depth interviews for evaluation input.

World Health Organization. (2012). Depression. A Global Public Health Concern Developed by Marina Marcus, M. Taghi Yasamy, Mark van Ommeren, and Dan Chisholm, Shekhar Saxena. WHO Department of Mental Health and Substance Abuse.

Creswell, J. W. (2013). Research design: Qualitative, quantitative, and mixed methods approaches: *Sage Publications.*

Beyen, T. K., Dadi, A. F., Dachew, B. A., Muluneh, N. Y., & Bisetegn, T. A. (2017). More than eight in every nineteen inmates were living with depression at prisons of Northwest Amhara Regional State, Ethiopia, a cross sectional study design. *BMC psychiatry, 17(1), 31.*

O'Cathain, A., Murphy, E., and Nicholl, J. (2008) 'The quality of mixed methods studies in health services research', *Journal of Health Services Research and Policy*, vol. 13, no. 2.

Hakansson, A., & Berglund, M. (2012). Risk factors for criminal recidivism–a prospective follow-up study in prisoners with substance abuse. *BMC psychiatry, 12(1), 111.*

Mazlan, N. H., & Ahmad, A. (2014). Validation of the Malay-translated version of the Center for Epidemiological Study–Depression Scale (CES-D). Advisory Board, Associate Editors and Case Reports Editorial Board Members iii-v Parental Issues Contributing To Information for Authors vi School Refusal: A Case Report 83-85, 190(1), 54-65.

Cohen, S., Kamarck, T., Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24, 385-396*

Rosenberg, M. (1965). Society and the adolescent self-image. Princeton, NJ: Princeton

Baharudin, A., Mislan, N., Ibrahim, N., Sidi, H., & Jaafar, N. R. (2013). Depression in male patients on methadone maintenance therapy. Asia-Pacific Psychiatry, 5(S1), 67-73.

Radloff, L. S. (1977). The CED-D scale: A self-report depression scale for research in the general population. Applied Psychological Measurement, 1, 385-401.

Javadi, M., & Zarea, K. (2016). Understanding Thematic Analysis and its Pitfall. *Journal of Client Care, 1(1), 33-39.*

Clarke, V., & Braun, V. (2014). Thematic analysis. In *Encyclopedia of critical psychology* (pp. 1947-1952). Springer New York

Kamoyo, J. M., Barchok, H. K., Mburugu, B. M. (2015) Effects of Imprisonment on Depression among Female Inmates in Selected Prisons in Kenya. Research on Humanities and Social Sciences www.iiste.org ISSN (Paper) 2224-5766 ISSN (Online) 2225-0484 (Online) Vol.5, No.16, 2015

Mukhtar, F., & Oei, T. P. (2011). A review on assessment and treatment for depression in Malaysia. Depression research and treatment, 2011.

Aday, L., & Cornelius, L. (2006). Designing and conducting health surveys: a comprehensive guide. 2006: San Francisco: Jossey-Bass.

Jamil, M. (2006). Validity and reliability study of Rosenberg self-esteem scale in Seremban school children. Malaysian Journal of Psychiatry, 15(2), 35-39.

Unver, Y., Yuce, M., Bayram, N., & Bilgel, N. (2013). Prevalence of depression, anxiety, stress, and anger in Turkish prisoners. Journal of forensic sciences, 58(5), 1210-1218.