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Established in 1954, International Journal of Social Psychiatry, a peer reviewed journal, provides a forum for the dissemination of findings related to social psychiatry. The journal is of interest to psychiatrists and other members of the multi-disciplinary team around the world concerned with the impact of social factors on individuals well being and mental health. Social psychiatry as a branch of psychiatry deals with the social, environmental and cultural factors in the aetiology and outcomes of psychiatric disorders as affecting individuals as well as communities. In addition to research reports on original research, social psychiatry also provides a link with social anthropology, cultural psychiatry, sociology and other disciplines in the field of mental health and is equally influenced by them. International Journal of Social Psychiatry publishes original empirical research, review articles, book reviews and letters to the editor. The journal welcomes brief communications that get fast track publication, and also aims to reflect the international nature of the readership by publishing state of the art reviews from different parts of the world reflecting the practice of psychiatric disciplines. International Journal of Social Psychiatry publishes: -studies on the role of social factors in the origins, course and outcome of psychiatric disorders -mental health needs of the international communities

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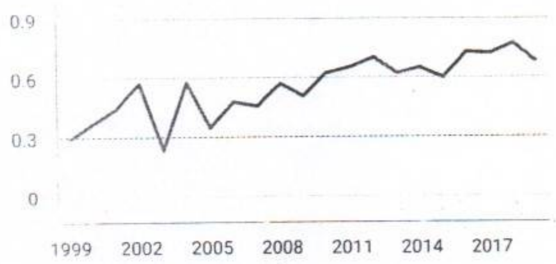

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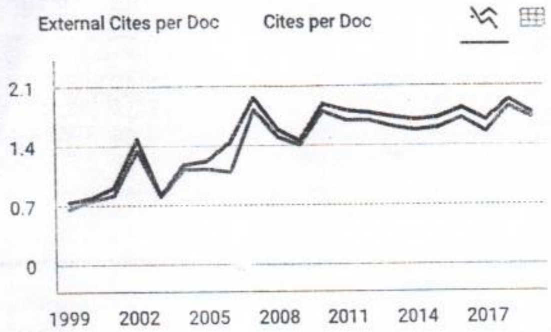

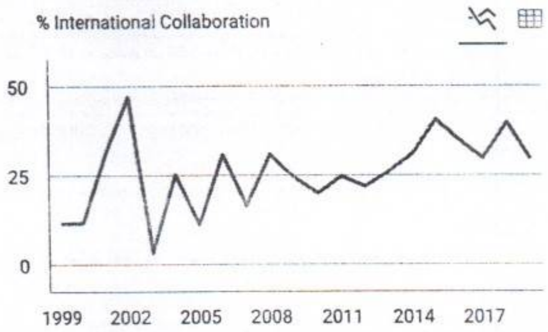

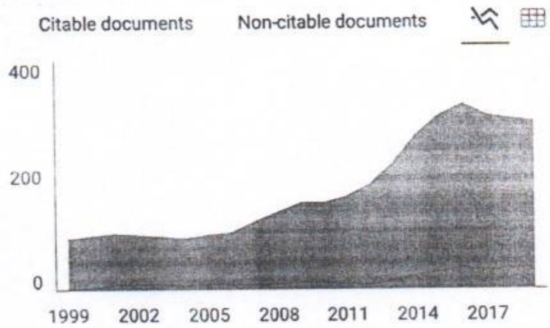

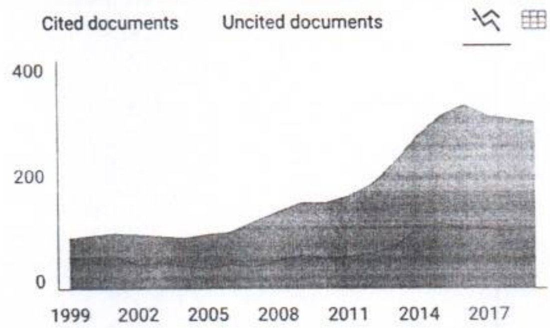

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Peter J. Guarnaccia, Roberto Lewis-Fernandez, Igda Martinez Pincay, Patrick Shrout, Jing Guo, Maria Torres, Glorisa Canino, Margarita Alegria

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Depression screening in Surabaya Indonesia: Urgent need for better mental health care for high-risk communities and suicide prevention for men

Margarita M Maramis[1], Jakobus Gerick Pantouw[2] and Cokorda Bagus Jaya Lesmana[3]

Abstract

Objectives: Despite its high prevalence and considerable burden, depression is not handled with the required urgency in Indonesia. Existing data from the government does not specifically note its prevalence and symptoms manifestation. This study screened depression in Surabaya, where the prevalence of mood disorder was reported to be higher than the national prevalence, in order to identify where action is most needed.

Methods: Cross-sectional study with non-random sampling. Participants consisted of samples from general population categorised as non-high-risk group, and prisoners, sex workers and drug users categorised as high-risk group. Depression screening was done using MINI-ICD10 self-rated depression questionnaire. Correlation between screening results and demographic data was analysed using chi-square test.

Results: Positive depression screening was significantly associated with grouping and educational background. High-risk group and participants with lower education background had significantly higher number of positive screening. Significantly higher proportion of participants in the high-risk group experience eight of the ten depression symptoms regardless of screening results. Higher proportion of depression positive male participants experienced suicidal/self-harm symptom.

Limitations: This study used non-random sampling method, therefore the results may not fully represent the general population. The screening instrument used did not account for depression and symptoms severity.

Conclusion: High-risk group with low educational background is in most urgent need of mental health help, and suicide prevention strategy is most needed for men.

Keywords

Depression, MINI-ICD10, high-risk community, suicide risk, screening

Introduction

Major Depressive Disorder (MDD), the most common mental disorder affecting ~120 million people worldwide, poses a considerable strain on the sufferer, family, as well as society at large. MDD is known to cause loss of productivity with an estimated loss of $36.6 billion per year attributed to the disease in the United States (Lépine & Briley, 2011). It is also reported to be one of the top leading cause of all years lived with disability, where major depressive disorder has been ranked as the third-leading cause of disability worldwide in 2015, up from the fourth rank in 2005 (GBD 2015 Disease and Injury Incidence and Prevalence Collaborators, 2016). Moreover, it is also associated with an increase in mortality risk, either due to increased suicide risk that is at least 20-fold greater in sufferers compared to the general population (Osby et al., 2001), or cardiovascular death where the greater severity of depressive symptoms has been associated with increased

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risk of cardiovascular death and stroke (Gump et al., 2005; Lespérance et al., 2002). Despite these considerable burdens to life, there seems to be a lack of interest in understanding the disease and its consequences in Indonesia, as evident by the low number of publications examining depression in Indonesia.

Indonesia, which boasts the largest population and economy in South-East Asia, has largely neglect the cause, manifestation, and consequences of mental illness, such as depression, in its population. There has been a lack of up to date comprehensive data concerning the prevalence and manifestation of depression within the Indonesian population. National data concerning mental illness in Indonesia from the 2013 Ministry of Health's report on basic health research reported the prevalence of emotional disorder at 6.0% in the 33 provinces of Indonesia (Ministry of Health Republic of Indonesia, 2013). However, the report did not identify specific emotional disorder such as depression, as the screening instrument used only screen for general psychological distress. The lack of recognition toward depression as an illness has presumably led to low awareness and persistent stigmatisation toward sufferers, which in turn caused lower treatment seeking, misdiagnosis, and improper treatment strategy. This is alarming, considering depression is intricately associated with suicide and suicidal behaviour, and Indonesia had a relatively high suicide rate, 4.3 per 100,000 people in 2012, a number which could be higher since the data was compiled without vital registration (World Health Organization [WHO], 2014). The 2018 Ministry of Health's report on basic health research partially rectify the problem by specifically screening for depression in the population, which reported 6.1% national prevalence (Ministry of Health Republic of Indonesia, 2018). However, the report did not specify the symptoms of depression that was found in the population. Understanding the specific symptoms exhibited by depressed patients is important since depression is not a consistent syndrome (Fried & Nesse, 2015a). Some depression symptoms can be effectively treated using medication (Hieronymus et al., 2016), while other symptoms may be treated with cognitive therapy (Taylor et al., 2010). Therefore analysing individual symptoms may lead to improved therapy (Fried & Nesse, 2015b). The ministry of Health's report also noted a large treatment gap of 91% nationally, suggesting inadequacy either in the public's understanding toward mental illness, or in the availability and accessibility of mental health services for the public (Ministry of Health Republic of Indonesia, 2018).

The depression problem is also of great concern in Surabaya, the second largest city in Indonesia and the capital of East Java province. The government's 2013 basic health research reported that Surabaya had a higher prevalence of emotional disorder 10.8%, compared to the 6.0% mean national prevalence and 5.7% mean provincial prevalence in East Java (Ministry of Health Republic of Indonesia, 2013). Although the government's 2018 report found lower prevalence for depression specifically, 4.5% in east Java compared to 6.1% national prevalence, the treatment gap for mental disorder in Surabaya was found to be alarmingly high at 87% (Maramis, 2015), which was similar to the reported 89.1% treatment gap in East Java (Ministry of Health Republic of Indonesia, 2018). Therefore, there is a need to study the characteristics and prevalence of depression in the population in order to enable formulation of more optimised treatment strategy for depression both on individual level, that is, personalised therapy, as well as on systemic level, that is, development of appropriate mental health policies.

This study screened depression in several population groups in Surabaya. The study reported on the percentage of depression among the general population, and from several groups considered to be in 'high-risk' for depression, including prisoners, sex workers, and intravenous drug users. The data was based on a short depression self-assessment questionnaire. The high-risk group was of special interest since the government reports only include samples from normal households, a lot of the high-risk population was excluded. The manifestation of depressive symptoms in the population and possible unique demographic or cultural influences toward disease phenotype were discussed.

Methods

Participants

Participants were categorised to 2 broad groups that were further categorised to 3 groups each. Participants from the general population, categorised as the non-high-risk group, were further divided into 3 age groups: adolescents and young adults (12–24 years old) mainly comprising of medical students at Universitas Airlangga Surabaya, as well as their relatives and friends; adults (25–60 years old) consisting of parents and relatives of the medical students and other adults living in Surabaya; and elderly (>60 years old) from non-governmental organisations senior citizens. Participants considered high-risk were categorised into 3 groups: prisoners from Medaeng prison, Surabaya; sex workers from the ex-Dolly red light district in Surabaya, and intravenous drug users (IVDUs) from residents of the Methadone Clinic at Dr Soetomo General Hospital, Surabaya. The total number of participants was 1,104 people.

Design

Cross-sectional study with non-random sampling technique.

Procedures

Participants were given an introduction to the study by the author, and were subsequently asked for an informed consent. Self-rated questionnaires were then distributed to the participants who have given their informed consent.

Instruments

Short 10 items depression questionnaire from MINI ICD-10 (Pettersson et al., 2018; Sheehan et al., 1998) translated to Indonesian v.2.1 by Yayasan Depresi Indonesia in 2004.

Statistical analysis

Statistical analysis was done using IBM SPSS statistics 25. Demographic data, and the proportion of suspected depression positive in the whole sample population and in each group were calculated. Chi-square test was used to determine the relationship between gender/groups and depressive symptoms experienced by participants.

Results

Demography

The total number of respondent was 1,104. There were 439 male respondents, and 665 female respondents, a gender ratio of 1:1.51. The mean age participants in the study was 32.69 ± 14.72 years old, where the youngest participant was 12 years old and the oldest participant was 82 years old.

In the non-high-risk group, there were 631 total respondents, 256 of which were male and 375 were female, gender ratio 1:1.46. The mean age of the participant in the group was 32.67 ± 17.41 years old, with the youngest participant being 14 years old, and the oldest participant 79 years old. The non-high-risk group was divided further into three age sub-groups: Adolescent and young adults (358 participants); Adults (195 participants); and Elderly (78 participants). There were no significant difference in gender ratio between the three age groups ($\chi^2 = 0.530$, $p = .767$).

In the high-risk group, the total number of participants were 473, 183 were male and 290 were female, gender ratio 1:1.58. The mean age of the group was 32.72 ± 10.08, with the youngest participant aged 12 years old, and the oldest 82 years old. The high-risk group consisted of three sub-groups: prisoners (206 participants); sex workers (235 participants); and Intravenous drug users (32 participants). There was a significant difference in gender ratio between the three sub-groups of the high-risk groups ($\chi^2 = 297.657$, $p < .001$). All the sex workers were female, while the majority of IVDUs and prisoners were male (90.6% and 74.8% respectively).

Depression screening and demography

Out of 1,104 participants, 105 were screened positive for depression, 9.5% of total participants. To understand the demographic background of participants screened positive for depression, the association between positive depression screening and various demographic characteristics were analysed and summarised in Table 1.

Analysing the whole sample, there was no significant association between positive depression screening and gender ($\chi^2 = 1.210$, $p = .271$), age ($\chi^2 = 5.536$, $p = .136$), income level ($G = 8.090$, $p = .232$), or marital status ($\chi^2 = 6.591$, $p = .159$). Significant association was observed between positive depression screening and educational background among all participants ($\chi^2 = 14.501$, $p = .012$). The proportion of depression positive participant was smallest in participants with undergraduate degree 5.5%, while participants with junior high and primary education backgrounds were the two highest, 14.8% and 13.3% respectively as summarised in. Examining the two main grouping, significantly higher proportion of participants in the high-risk group were screened depression positive, 15.4%, compared to the non-high-risk group, 5.1% ($\chi^2 = 33.729$, $p = .000$).

Within the non-high-risk group, there was no significant correlation between positive depression screening and the sub-groups of age the participants were divided into ($\chi^2 = 2.590$, $p = .274$), gender ($\chi^2 = 1.242$, $p = .265$), education background ($G = 8.849$, $p = .115$), marital status ($G = 2.811$, $p = .590$), or income level ($G = 2.666$, $p = .751$). Similarly, there were no significant correlation between positive depression screening and the sub-groups ($\chi^2 = 3.424$, $p = .180$), age ($G = 4.103$, $p = .251$), gender ($\chi^2 = .519$, $p = .471$), education background ($\chi^2 = 0.623$, $p = .961$), marital status ($G = 6.935$, $p = .226$), or income level ($G = 3.523$, $p = .620$) in the high-risk group.

Gender difference in depression symptoms manifestation

The manifestation of depression symptoms among male and female participants were analysed to examine if there was a gender difference in symptoms experienced. There was no significant difference in the manifestation of depression symptoms 1–9 of the questionnaire between male and female participants, both among all participants, among participants screened positive for depression only, or participants screened negative for depression only, as summarised in Table 2. Significant correlation was observed between gender and the suicidal ideation symptom (symptom 10 in the questionnaire). Male participants had a significantly higher proportion of participants with suicidal ideation symptom compared to female participants for all participants (Male = 10.3%, Female = 5.7%, $\chi^2 = 7.826$, $p = .005$), as well as for depression positive participants only (Male = 31.1%, Female 10.3%, $\chi^2 = 7.550$, $p = .006$), but not for depression negative participants only (Male = 7.7%, Female = 5.3%, $\chi^2 = 2.320$, $p = .128$). This result suggested that gender does not affect the manifestation of most depression symptom in this population, except for the suicidal ideation symptom. Suicidal ideation symptom is more common among male participants, especially those that are screened depression positive.

Table 1. Distribution of participant according to demographic background and positive screening results.

		Whole population	Depression positive	Non-high-risk group	Depression positive	Total adolescent	Depression positive	Total adult	Depression positive	Total geriatric	Depression positive	Total high-risk group	Depression positive	Total prisoners	Depression positive	Total sex workers	Depression positive	Total IVDUs	Depression positive
	Proportion of total sample	100.0%	9.5%	57.2%	5.1%	32.9%	3.9%	17.7%	6.2%	7.1%	7.7%	42.8%	15.4%	18.7%	18.9%	21.3%	12.8%	2.9%	12.5%
Gender	Male	39.8%	10.7%	40.6%	6.3%	41.6%	6.0%	38.5%	8.0%	41.0%	3.1%	38.7%	16.9%	74.8%	18.2%	0.0%	0.0%	90.6%	10.3%
	Female	60.2%	8.7%	59.4%	4.3%	58.4%	2.4%	61.5%	5.0%	59.0%	6.4%	61.3%	14.5%	25.2%	21.2%	100.0%	12.8%	9.4%	33.3%
Marriage status	Unmarried	46.7%	7.6%	62.4%	4.3%	97.2%	4.0%	23.6%	6.5%	0.0%	0.0%	25.8%	18.0%	43.7%	18.9%	7.7%	16.7%	43.8%	14.3%
	Married	33.1%	11.8%	32.8%	6.8%	2.5%	0.0%	70.8%	6.5%	76.9%	8.3%	33.4%	18.4%	44.7%	17.4%	21.7%	21.6%	46.9%	13.3%
	Divorced	15.7%	11.6%	1.1%	0.0%	0.3%	0.0%	2.6%	0.0%	1.3%	0.0%	35.1%	12.0%	9.2%	26.3%	61.3%	10.4%	9.4%	0.0%
	Diseased spouse	4.5%	6.0%	3.6%	3.1%	0.0%	0.0%	3.1%	0.0%	21.8%	5.9%	5.7%	7.4%	2.4%	20.0%	9.4%	4.5%	0.0%	0.0%
Education	No formal education	7.0%	11.7%	2.4%	0.0%	2.0%	0.0%	4.1%	0.0%	0.0%	0.0%	13.1%	14.5%	5.8%	33.3%	21.3%	10.0%	0.0%	0.0%
	Primary school	14.9%	13.3%	3.0%	0.0%	0.3%	0.0%	4.6%	0.0%	11.5%	0.0%	30.9%	15.1%	17.5%	13.9%	46.0%	14.8%	6.3%	50.0%
	Secondary school	12.9%	14.8%	4.8%	13.3%	2.8%	0.0%	4.1%	25.0%	15.4%	2.6%	23.7%	15.2%	19.4%	20.0%	28.1%	13.6%	18.8%	0.0%
	High school	32.1%	9.0%	37.4%	5.9%	37.2%	3.8%	33.8%	7.6%	47.4%	5.1%	24.9%	15.3%	42.7%	18.2%	4.7%	0.0%/	59.4%	10.5%
	Under-graduate	31.4%	5.5%	49.4%	3.8%	57.8%	4.3%	44.6%	3.4%	23.1%	0.0%	7.4%	20.0%	14.6%	20.0%	0.0%	0.0%	15.6%	20.0%
	Post-graduate	1.7%	10.5%	3.0%	10.5%	0.0%	0.0%	8.7%	11.8%	2.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Income level	No income	34.1%	8.8%	43.9%	5.1%	64.5%	4.8%	21.5%	7.1%	5.1%	0.0%	20.9%	19.2%	43.2%	21.3%	3.4%	0.0%	6.3%	0.0%
	< 1 Million	35.1%	10.1%	24.7%	5.1%	27.1%	3.1%	16.9%	6.1%	33.3%	11.5%	48.8%	13.4%	33.0%	16.2%	61.7%	11.0%	56.3%	22.2%
	1–5 Million	26.9%	9.8%	26.1%	4.2%	7.3%	0.0%	52.3%	3.9%	47.4%	8.1%	27.9%	16.7%	21.4%	18.2%	33.6%	17.7%	28.1%	0.0%
	5–10 Million	3.1%	11.8%	4.1%	11.5%	1.1%	0.0%	6.7%	23.1%	11.5%	0.0%	1.7%	12.5%	1.5%	33.3%	0.9%	0.0%	9.4%	0.0%
	>10 Million	0.9%	0.0%/	1.1%	0.0%	0.0%	0.0%	2.6%	0.0%	2.6%	0.0%	0.6%	0.0%	1.0%	0.0%	0.4%	0.0%	0.0%	0.0%

Table 2. Percentage of male and female population exhibiting depression symptoms based on questionnaire answers.

No.	Symptoms for all subject	Depression positive female	Depression positive male	Significance test	Depression negative female	Depression negative male	Significance test	All female population	All male population	Significance test
1	Feeling sad, down, depressed all day, every day?	84.5%	83.0%	$\chi^2=2.489$, $p=.115$	24.7%	20.4%	$\chi^2=0.043$, $p=.835$	29.9%	27.1%	$\chi^2=1.024$, $p=.312$
2	Lack of interest in things, or don't enjoy things used to be enjoyed?	89.7%	89.4%	$\chi^2=0.002$, $p=.961$	28.8%	33.4%	$\chi^2=2.360$, $p=.125$	34.1%	39.4%	$\chi^2=3.128$, $p=.074$
3	Feeling tired and have little energy?	86.2%	87.2%	$\chi^2=0.024$, $p=.878$	28.5%	27.6%	$\chi^2=1.024$, $p=.312$	33.5%	33.9%	$\chi^2=0.020$, $p=.889$
4	Change in appetite or weight?	65.5%	46.5%	$\chi^2=0.261$, $p=.609$	29.3%	29.3%	$\chi^2=0.000$, $p=.997$	32.5%	33.7%	$\chi^2=.182$, $p=.670$
5	Difficulty sleeping?	79.3%	83.0%	$\chi^2=0.227$, $p=.634$	27.7%	31.4%	$\chi^2=1.580$, $p=.209$	32.2%	36.9%	$\chi^2=2.625$, $p=.105$
6	Noticeably moving or speaking slower than usual, or oppositely fidgety, restless and move around more?	77.6%	78.7%	$\chi^2=0.020$, $p=.889$	22.2%	24.2%	$\chi^2=0.534$, $p=.465$	27.1%	30.1%	$\chi^2=1.174$, $p=.279$
7	Loss of confidence, feeling worthless, lower than other people?	87.9%	91.5%	$\chi^2=0.350$, $p=.554$	30.6%	27.6%	$\chi^2=1.096$, $p=.295$	35.6%	34.4%	$\chi^2=0.179$, $p=.672$
8	Feeling guilty or blaming yourself?	93.1%	91.5%	$\chi^2=0.096$, $p=.757$	39.7%	39.3%	$\chi^2=0.017$, $p=.895$	44.4%	44.9%	$\chi^2=0.028$, $p=.867$
9	Difficulty thinking, concentrating, or making decisions?	94.8%	85.1%	$\chi^2=2.847$, $p=.092$	42.7%	41.1%	$\chi^2=0.249$, $p=.617$	47.2%	45.8%	$\chi^2=0.218$, $p=.641$
10	Have thoughts of self-harm, suicide, or wishing for death?	10.3%	31.9%	$\chi^2=7.550$, $p=.006$*	5.3%	7.7%	$\chi^2=2.320$, $p=.128$	5.7%	10.3%	$\chi^2=7.826$, $p=.005$*

*$p<.05$.

Depression symptoms in high-risk group versus non-high-risk group

The symptoms expression in participants categorised in the two main groups was also analysed to determine if high-risk subjects experience different symptoms compared to the non-high-risk subjects and would need a different treatment approach. The comparison of the symptoms exhibited in the two groups are summarised in Table 3. Comparing all the participants of the two groups, significant correlation between grouping and symptoms was observed for all symptoms 1 through 8, but not for symptoms 9 and 10. For symptoms 1–8, the high-risk group consistently has a higher proportion of participants experiencing the symptoms compared to the non-high-risk group, where the difference in proportion was at least 12 percentage point. While for symptoms 9 and 10, the difference in proportion between the two groups were only 3.1% and 2.8% respectively.

Similarly, analysing only the depression negative participants in the groups also showed significant correlation between grouping and depression symptoms 1 through 8, but not for symptoms 9 and 10. The high-risk group also consistently has significantly higher proportion of participant experiencing symptoms 1 through 8, and higher proportion of participants experiencing symptom 10 although the difference was not significant. For symptom 9, the non-high-risk group has higher proportion of participants experiencing the symptom, but the difference was not significant.

However the same pattern of association was not observed when examining only the depression positive participants. Significant association between grouping and symptoms was only observed for symptom 8 where significantly higher proportion of high-risk depression positive participants experienced the symptom. For symptoms 1– 6 and 9, the high-risk group had higher proportion of participants with the symptoms. However, for symptoms 7 and 10, the non-high-risk group had higher proportion of participant exhibiting the symptoms. For symptom 10, although the difference was not statistically significant, the percentage of participant experiencing the symptom in the non-high-risk group is more than twice the percentage of participant in the high-risk group.

This finding suggested that individuals categorised as high-risk are more likely to experience depression symptoms even if they were not found to be depressed during the screening, especially for symptoms 1–7. While for symptom 8 high-risk individuals are always more likely to experience the symptom regardless of screening results.

Discussion

The results suggested that Surabaya is facing a bigger mental health challenge than other regions of East Java, Indonesia, and the world. The 9.5% depression positive percentage found in this study was higher than the 6.0% national and 5.7% East Java provincial prevalence of emotional disorder from the 2013 government report, the 6.1% national and 4.5% East Java provincial prevalence of depression from the 2018 government report, as well as ~4.4% global prevalence of depression although there was a difference in sampling methods (Ministry of Health Republic of Indonesia, 2013, 2018; WHO 2017). This study used non-random sampling method, while national and provincial data were compiled using random sampling methods, which may resulted in the considerable difference in depression positive findings. Another possible explanation for the high proportion of depression positive results in this study is the increase in urbanisation in the area that has been happening in the region over the last few decades. The latest government census indicated that the population of Surabaya increased by ~200,000 people from year 2000 to 2010 bringing the latest known total to 2,765,487 people, which likely have increased further by now (BPS-Statistics of Surabaya Municipality, 2017). This may lead to problems such as overpopulation, high unemployment rate, rising surface temperature of the city as the impact of climate on mental health (Majeed & Lee, 2017). Such problems have been reported to be stress factors of urban life that can contribute to predisposition for mental disorders (Peen et al., 2010), along with rapid changes, competitiveness and social demands. In order to effectively handle the mental illness problem in Surabaya, it is important to understand the demographic backgrounds of the sufferers as well as any difference in symptoms exhibited by specific demographic groups.

High percentage of depression within high-risk group

Examining the data further, it is apparent that the high-risk group greatly inflated the number of depression percentage in the sample. The percentage proportion of depression positive participants in the high-risk group was more than three times the percentage proportion of the non-high-risk group, 15.4% in the high-risk group compared to 5.1% in the non-high-risk group. Moreover, the results indicated that even if not screened depression positive, significantly higher proportion of the participants in the high-risk group still experience depression symptoms compared to the non-high-risk group. This confirmed that prisoners, sex workers, and intravenous drug users are at a higher risk for depression compared to the general population since significantly higher percentage of subjects in the group experience subclinical symptoms of depression compared to the non-high-risk group. Therefore, it is important to understand factors that might contribute to depression in the high-risk group and identify ways to address them in order to solve the depression problem in Surabaya.

Prisoners, sex workers, and IVDUs were categorised as high-risk for mental disorder due to their living condition.

Table 3. Manifestation of depression symptoms in high-risk group compared to non-high-risk group based on questionnaire.

No.	Symptoms for all subject	Depression positive high-risk	Depression positive non-high-risk	Significance test	Depression negative high-risk	Depression negative non-high-risk	Significt	All high-risk population	All non-high-risk population	Significance test
1	Feeling sad, down, depressed all day, every day?	82.2%	87.5%	$\chi^2=2.489$, $p=.115$	33.3%	16.2%	$\chi^2=39.37$, $p<.001$**	40.8%	19.8%	$\chi^2=58.10$, $p<.001$**
2	Lack of interest in things, or don't enjoy things used to be enjoyed?	87.7%	93.8%	$\chi^2=0.877$, $p=.349$	36.0%	27.0%	$\chi^2=9.052$, $p=.003$*	44.0%	30.4%	$\chi^2=21.47$, $p<.001$**
3	Feeling tired and have little energy?	89.0%	81.3%	$\chi^2=1.169$, $p=.280$	32.0%	25.5%	$\chi^2=4.947$, $p=.026$*	40.8%	28.4%	$\chi^2=18.71$, $p<.001$**
4	Change in appetite or weight?	72.6%	56.3%	$\chi^2=2.171$, $p=.099$	38.0%	23.5%	$\chi^2=24.20$, $p>.001$**	43.3%	25.2%	$\chi^2=40.26$, $p<.001$**
5	Difficulty sleeping?	82.2%	78.1%	$\chi^2=0.239$, $p=.625$	37.8%	23.4%	$\chi^2=24.02$, $p<.001$**	44.6%	26.1%	$\chi^2=41.02$, $p<.001$**
6	Noticeably moving or speaking slower than usual, or oppositely fidgety, restless and move around more?	80.8%	71.9%	$\chi^2=1.041$, $p=.308$	26.5%	20.7%	$\chi^2=4.551$, $p=.033$*	34.9%	23.3%	$\chi^2=17.90$, $p<.001$**
7	Loss of confidence, feeling worthless, lower than other people?	89.0%	90.6%	$\chi^2=0.060$, $p=.807$	36.0%	25.0%	$\chi^2=13.87$, $p<.001$**	44.2%	28.4%	$\chi^2=29.68$, $p<.001$**
8	Feeling guilty or blaming yourself?	95.9%	84.4%	$\chi^2=4.191$, $p=.041$*	51.7%	31.4%	$\chi^2=41.61$, $p<.001$**	58.6%	34.1%	$\chi^2=65.63$, $p<.001$**
9	Difficulty thinking, concentrating, or making decisions?	91.8%	87.5%	$\chi^2=0.473$, $p=.492$	40.5%	43.1%	$\chi^2=0.651$, $p=.420$	48.4%	45.3%	$\chi^2=1.037$, $p=.309$
10	Have thoughts of self-harm, suicide, or wishing for death?	15.1%	31.3%	$\chi^2=3.641$, $p=.056$	8.0%	5.0%	$\chi^2=3.688$, $p=.055$	9.1%	6.3%	$\chi^2=2.944$, $p=.086$

*$p<.05$. **$p<.01$.

Prisoners are at risk for mental disorder due to their environment that is considered inherently bad for mental health due to various problems including: overcrowding, violence, enforced solitude, lack of privacy, lack of meaningful activity, isolation from social network, and insecurities about future prospects (Durcan & Zwemstra, 2014). Conversely, some studies suggested that mentally ill person, including those suffering from depression, were more likely to commit crimes, contributing to the total number of mentally ill prisoners (Fazel et al., 2010, 2014, 2015). The prevalence of mental illness in prison has consistently been reported to be higher than in the general population, while access to mental health treatment has been reported to be severely limited in many prisons (Fazel & Danesh, 2002; Fazel et al., 2016; Reingle Gonzalez & Connell, 2014). This condition is likely to be worse in Indonesia, where psychiatric help is not readily available for much of the general public and much less for prisoners, with the ratio between psychiatrist and the population reported to be 1:323,000, which is much lower than the 1:30,000 psychiatrist to population ratio recommended by the WHO. Similarly, sex workers are among the demography at the highest risk for mental health issues due to the nature of their work (Rekart, 2005; Romans et al., 2001; Rössler et al., 2010; Roxburgh et al., 2008; Ulibarri et al., 2013). High rate of abuse is one of the key driving factors for mental health issue among sex workers, a factor that is likely to be amplified in Indonesia where sex work is illegal, leaving sex workers with little protection. Moreover, the data indicated that the majority of sex workers were forced into the illegal trade by being trafficked or due to financial necessity, which would impose a big mental burden on them. These burdens along with social pressure and stigmatisation from society due to the religious nature of the population contribute to predispose sex workers in Surabaya for emotional disorders. For IVDUs on the other hand, mental disorder can both be a precursor for their substance abuse, or a side-effect/result from their drug use, therefore high co-morbidity between the two has consistently been reported (Swendsen et al., 2010). Knowledge about mental disorders within the high-risk group is still lacking, therefore most of them do not feel the need to get help. These factors contributed to the increased depression percentage in the high-risk group, highlighting the need to give better attention to people that are considered to be in 'high-risk' for mental illness to improve the overall mental health of the population. One way to address this problem is to conduct regular screening for mental disorders for the three high-risk populations.

The three high-risk communities are highly intertwined with each other as well as with the general population. The reported high number of drug abuse among sex workers means many sex workers may end up as IVDUs (Rekart, 2005; Roxburgh et al., 2008; Ulibarri et al., 2013), and criminalisation of both sex work and drug use in Indonesia means they may also end up being in prisons. Additionally, substance abusers were found to be more likely to commit crime, thus increasing their likelihood of incarceration (Bennett & Holloway, 2009). While prison and IVDU rehabilitation facility are generally isolated communities separated from the general population, there are still constant interaction and interchange occurring between the communities and the general population, therefore mental health issues in these communities cannot be viewed as exclusive from the mental health of the general population. Addressing mental health needs and increasing awareness in prisons and IVDUs rehabilitation facilities would reduce stigmatisation and discrimination, as well as help improve health and quality of life within the community (Fazel et al., 2016; Durcan & Zwemstra, 2014; Reingle Gonzalez & Connell, 2014). This would help prepare people from these communities to adjust better upon re-joining the general population, thus decreasing incidents of re-offending, and ultimately reducing the number of people returning to these facilities and their associated cost, benefiting the population as a whole. Responding to the mental health needs of these communities would also greatly help alleviate the burdens of the people that are in constant interaction with them (e.g. the staffs working in the facilities). Prisons and drug rehabilitation centres are considered as mentally demanding work environment (Goldberg et al., 1996; Johnson et al., 2005), which would be further burdened by unidentified or untreated case of mental illness in the community, putting staffs at risk for mental illness themselves. Therefore, it is recommended that mental health care is integrated into prison and IVDU rehabilitation centres, starting by improving the availability of mental health services in these facilities.

Another factor that was identified to significantly correlate with depression in this study was education. Higher number of participants with lower educational background were found to be depression positive, and the majority of these participants with lower educational background were from the high-risk group. It is likely that lower educational background predisposes individuals both from becoming high-risk individual that is at risk of depression, as well as for depression itself. This finding is consistent with other studies that reported association between low educational background with increased depression risk, crime participation, and drug abuse (Bjelland et al., 2008; Groot & van den Brink, 2010; Peyrot et al., 2016). People with lower educational background are more likely to have lower income, which would incur lower socio-economic related stresses. These stress factors can lead to depression, drug abuse as a coping mechanism, or crime and sex work as an attempt to increase income and relief socio-economic stress. On the other hand, higher education levels protect individuals from depression by providing them with the mental resources to cope better in stressful situations (Bjelland et al., 2008). Therefore, ensuring better access to education might help alleviate the mental health burden in Surabaya by equipping individuals with protection against depression, as well as preventing them from becoming high-risk individuals.

High suicide risk in Surabaya

The study also highlight the high risk for suicide in Surabaya. Out of all participants, 7.5% claimed to have self-harm or suicidal thought, which is a suicide risk rate of 75 per 1000 people, and extrapolated to the total population of Surabaya in 2010 means more than 200,000 people are at risk of suicide. A recent study that examined suicide risk in Surabaya using the Sheehan-Suicidality Tracking Scale reported an even higher suicide risk, at 12.67% (Bestari et al., 2020). These findings were much higher than the 4.5 per 100,000 people suicide rate in Indonesia reported by WHO (2014). This suggest that there is an urgent need to implement suicide prevention strategies in Surabaya. Considering that this suicide ideation symptom among the depression positive is higher in the non-high-risk group than the high-risk group, prevention measures should be more focused on depressed people in the general population instead of specific facilities like prisons or drugs rehabilitation centres. The self-harm and suicide ideation symptom was also found to be more common in male subjects compared to females exacerbated by the result that showed more male subjects found to be depression positive compared to female subjects, although the difference was not significant. This result is in contradiction with other studies that had reported the suicidal ideation symptom is more commonly experienced by female patients, although males were found to be more likely to commit suicide (Canetto & Sakinofsky, 1998). Furthermore, depression is traditionally reported to be more prevalent in females compared to males (Weissman, 1996). However, recent study in Malaysian teenage population, which may mirror Indonesian cultural and traditional values more closely than results from studies in western population, also found reported higher suicidal ideation among male subjects compared to female subjects (Ibrahim et al., 2017). Thus, these results were likely to be affected by local culture, where women tend to communicate and share their feelings, which help them solve and reduce their burdens or emotional problems instead of resorting to self-harm or suicide, whereas men tend to keep their problems to themselves and only have competitive interactions, which means they tend to bear more unresolved emotional burdens that can lead to thoughts of self-harm and suicide (Mohindra & Azhar, 2012). In big cities, men are demanded to show superiority, and be able to overcome any problems, thus when faced with an unavoidable problem, men tend to feel more alone and may come up with suicidal ideas. Suicidal ideation may occur when a person feels they are no longer able to cope with an overwhelming situation. This may stem from financial problems, death of a loved one, broken relationship, or devastating/debilitating illness. Past suicidal ideation plays important predictive factor for discriminating suicide attempters from suicide non-attempters (Park et al., 2017).The most common situations and life events that leads to suicidal thoughts include major childhood adverse events (e.g. sexual abuse), discriminated for being gay, lesbian, transgender or bisexual, having access to lethal means, a long history of being bullied, and chronic sleep problems. In males, condition like loss of job or unemployment, low income, neurosis, social isolation, espousal loss, bereavement, affective disease, functional impairment, physical illness, military personnel, traumatic brain injury, PTSD and other mental health issues (O'Rourke et al., 2020). Suicidal ideation must be taken seriously, even if it only surfaced fleetingly, since it is a sign of someone looking for a release. Therefore, it is important to implement suicide prevention strategy and tailored approaches that would accommodate the male populations that are not used to seek help for their mental health problems.

Limitations and future direction

This study is the first comprehensive screening study of its kind that is done in Surabaya, however, there were limitations in the method that was used. The non-random sampling technique used in this study might have skewed the results, especially for the non-high-risk group. The majority of the participants in the group consisted of medical students of a reputable university and their relatives, thus the result might not be a complete representation of the entire population in Surabaya. Therefore, to get a better representation of the whole population in Surabaya, it is recommended to collect data using a random-sampling technique to accurately determine the prevalence of depression in future studies.

The questionnaire that was used in the study was also not ideal due to the binary nature of the answers obtained. More recent depression screening questionnaires such as PHQ-9 or Kessler-10 uses scales to rate the severity or frequency of symptom occurrences (Akena et al., 2012; Martin et al., 2006). This would allow the determination of the severity of the depression suffered by the population, thus enabling identification of the demography that is in most need of mental health assistance, and appropriate method to tackle the problem in said population.

Conclusion

Despite these limitations, this study clearly identified that the high-risk group has a significantly higher depression risk. Therefore, efforts should be focused on alleviating the depression burden in this group by making mental health treatment more available to these communities and preventing individuals from becoming part of the high-risk group. This can be done by integrating mental health care to drug rehabilitation programs and prison to improve access to treatment, and ensuring better access to education to help better equip individuals to cope with the stresses of urban life. Secondly, the study also highlights the high suicide risk that was found in Surabaya, especially among depressed men. This would require a suicide prevention strategy that caters to the needs of men based on local culture.

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