

Comparison of Rates of Psychotic Experiences, Depressive Symptoms, Anxiety Symptoms, and Common Mental Health Risk Factors of People Living in Urban and Non-Urban Areas in Indonesia

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Abstract

The prevalence of risk factors and symptoms of mental-health problems has been found to be higher in urban than non-urban areas. However, most studies are conducted in developed countries, and we are unsure whether a similar pattern can be observed in a developing country. In the present study, we compared rates of common mental health risk-factors and symptoms of psychosis, depression, and anxiety between urban and non-urban residents. A community sample of 844 participants completed an anonymous cross-sectional online survey. T-tests and Mann-Whitney U Test were used to compare participants' scores on mental health-risk factors and symptoms based on their area of residence. Our analyses showed that participants living in urban areas experienced a higher frequency of loneliness, being bullied at home, positive symptoms of psychosis, depression, and stronger beliefs of negative schemas. These results reveal a similar pattern of higher frequencies of risk factors and symptoms of mental-health problems among people living in urban areas was found in a developing country. Urban living may be linked exposure to mental health risk factors and thus, increase the risk of having symptoms of mental health problems. Future research should investigate this mechanism in a longitudinal data.

Keywords

Anxiety, depression, psychotic experiences, risk factors, schizophrenia, urbanicity

The differences in rates of mental disorders between people living in urban versus non-urban areas are well known. This pattern can be traced back to 100 years ago when a book was published showing that the rates of "insanity" vary according to geographical location in the United States (White, 1903), in which the rates were shown to be higher in an urban area. Since then, many more studies have been conducted, and recent reviews have shown that rates of mental disorders such as psychosis are higher in urban areas (van Os, 2004; Kelly et al., 2010).

Studies have consistently demonstrated the differential effect of urbanicity on the prevalence rate of the diagnosis of schizophrenia, broader psychosis disorders, and other mental health disorders. A study found that male participants living in urban areas had incidence rates of schizophrenia two times higher than that of males living in rural areas (Kelly et al., 2010). The differential effect of residency area was also observed in other DSM Axis-I disorders, such as

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major depression, simple phobia, social phobia, dysthymic disorder, agoraphobia, panic disorder, generalized anxiety disorder, obsessive-compulsive disorder, or bipolar disorder (Kringlen, Torgersen & Cramer, 2006). Compared with the participants residing in rural areas, city dwellers showed a relatively higher lifetime and 12-month prevalence of the diagnosis of those disorders (Kringlen, et al., 2006). In term of the severity of the disorder, this study also found that city dwellers had a higher prevalence of severe mental health problems, as defined by having three or more Axis-I disorders (Kringlen et al., 2006).

Another way to define urbanicity was by population density. People who live in the most densely populated areas had a 68%–77% higher risk of developing psychosis and 12%–20% higher risk of developing depression compared with the baseline group (Sundquist, Frank, & Sundquist; 2004). Furthermore, Pedersen and Mortensen (2001) found that alongside the number of the inhabitants in a particular area, the effect of urbanicity on the risk for schizophrenia was also affected by the accumulated number of years spent in urban versus non-urban areas during their upbringing. People who lived in urban areas during their first 15 years showed a 2.75-fold increased risk of developing schizophrenia (Pedersen & Mortensen, 2001).

The effect of urbanicity on the prevalence of psychosis is further supported by a meta-analysis that includes epidemiological studies with a predominantly European population (Vassos, Pedersen, Murray, Collier, & Lewis, 2012). When strict criteria were applied to define schizophrenia and urbanicity, the estimated pooled odd ratio (OR) for schizophrenia was 2.37. An OR of 2.38 was found when a broader definition of psychosis, urbanicity (place of residence, population size, population density), and time of exposure (during birth, upbringing, and onset of illness) were applied to include more studies for the analysis (Vassos et al., 2012).

The effect of urbanicity was related not only to the diagnosis of psychotic disorder but also to the symptoms of psychosis (van Os, Hanssen, Bijl, & Vollebergh, 2001). An epidemiological study using a sample from the Netherlands shows that the lifetime prevalence of diagnosis of psychotic disorder, clinician-assessed psychotic

symptoms, and rating of psychosis-like symptoms increase in parallel with the level of population density (van Os et al., 2001). A negligible change occurred in the parameter when they adjusted for age, sex, level of education, and country of birth of the subject and parents. Moreover, the community level of psychotic symptoms was strongly correlated with diagnosis of psychotic disorder at all levels of urbanicity, suggesting that urban environment was not only associated with an increased level of psychotic disorders but also with an increased level of psychosis susceptibility (van Os et al., 2001).

The effect of urbanicity has also been found outside developed countries and Western culture, where the urban environment may have different physical and social settings. A study in Uganda with young adults (18–30 years old) examined the relationship between urbanicity (urban versus semi-urban versus rural place of birth) and symptoms of mental health problems, such as symptoms of psychosis, depression, and anxiety (Lundberg, Cantor-Graae, Rukundo, Ashaba, & Ostergren, 2009). The study found that compared with people who are born in rural areas, people who are born in urban areas have higher lifetime delusional ideation experience, symptoms of psychosis, depression, and anxiety even after adjusting for age, gender, and education (Lundberg et al., 2009). Also, a study in China investigated whether urbanicity (urban birth and current living), work migrancy, and residential stability related to prevalence and severity of psychotic experiences (PEs) with a young adult male sample (18–34 years old) (Coid et al., 2017). They found that the prevalence of three or more PEs was related with urban birth, current living status, and residential stability. In Indonesia, a study examined the effect of urban-rural migration on psychological problems (Lu, 2010) and showed that moving from rural to urban areas increased participants' experience of depressive symptoms. Interestingly, the study showed that depressive symptoms increased only in participants who moved to urban areas by themselves. Reduced social support was suggested as an explanation for why only the participants who moved to urban areas by themselves experienced an increase in depressive symptoms, but participants who moved to urban

areas with family members did not experience such changes.

However, we do not know why rates of mental disorders between urban versus non-urban dwellers differ. Several possible explanations can be given. First, medical coverage in urban areas is better. Unequal medical coverage means that sufferers of mental disorders are not higher in urban areas in comparison to non-urban areas, but they are just detected and diagnosed better in urban areas. One consequence of this situation is that the rates of mental disorder symptoms between urban versus non-urban dwellers should not differ. Second, the rates of people with mental disorders among urban dwellers are higher because the number of people with mental disorder is higher as a result of the higher number of common risk factors of mental disorders in urban areas. If this explanation is true, then it should be reflected by the observation that the levels of mental disorder symptoms and common risk factors are higher in urban areas. Third, the number of people with mental disorders in urban areas is higher, but this finding is not attributable to common risk factors of mental disorders. Thus, to examine possible explanations above, this study aims to compare participants' mental health risk factors and symptoms on the basis of their area of residence. Specifically, we hypothesized that participants living in urban and non-urban areas would show differences in a) common risk factors such as loneliness, bullying victim experience, child abuse experience, and negative schema; and b) symptoms of psychosis, depression, and anxiety.

Method

Participants and Procedure. We recruited participants as part of a multi-national study on psychosis risk factors and PEs (part of this data has been published in Jaya, Ascone, & Lincoln, 2017). Participants came from a community sample that covered the continuum of PEs. Participants were recruited through Crowdfunder and other websites, such as Internet forums or social networking websites, and were requested to complete an anonymous 30-minute online survey. To follow the sampling method from the COMED study (Hanssen, Krabbendam, Vollema, Delespaul, & van Os,

2006), we also advertised our study in Internet forums focused on mental disorders, particularly schizophrenia, to obtain a sample with variation reflecting the continuum of psychosis. Participants who were recruited from Crowdfunder received US\$0.50 for completing the survey. The incentive was matched to the median hourly wage in Amazon MTurk (Buhrmester, Kwang, & Gosling, 2011). Participants recruited from other websites were not given compensation for reasons of data security. Previous studies have shown that the use of an Internet survey to collect self-report data on mental health symptoms is reliable (e.g., Moritz et al., 2013) and that recruiting participants via crowdsourcing websites produces a sample with heterogeneous demographic data (e.g., Shapiro et al., 2013). Participants had to be above 18 years old and agree to fill out written informed consent forms to be able to participate in the study. The study received ethical approval from the ethical committee of the German Psychological Society (DGPs, 119 TL062014_2).

A total of 844 participants completed the survey. However, we included only 832 participants for data analysis due to missing information on the current area of residence (urban and non-urban).

Measures. A native Indonesian speaker conducted backtranslation and cultural adaptation of measures according to guidelines (Schmitt & Eid, 2007).

Demographic Measures. Demographic data consist of participants' age, sex, socioeconomic status, and urbanicity. Participants were asked to indicate their sex (male or female) and age. Participants' socioeconomic status was measured with a multidimensional index developed by Lampert and Kroll (2009). Scores from measures of education (range: 1 to 7), household income (range: 1 to 7), and job position (range: 1 to 7) were summed up to produce the socioeconomic status index (range: 3 to 21). The options for questions about education and household income were created based on the census categories published by statistical offices of Indonesia. Participants were also asked to indicate if they have ever had a mental health problem and schizophrenia or other psychotic

disorders during their lifetime. Urbanicity was measured with a self-report question on whether the participant is currently living in a city (urban) or not in a city (non-urban).

Mental Health Risk Factor Measures. Mental health risk factors consist of measures of loneliness, bullying victim experience, child abuse experience, and negative schemas. Loneliness was measured using the UCLA Loneliness Scale, Version 3 (Russell, 1996), which consists of 20 items (e.g., "I lacked companionship"). Participants were asked to rate their experiences during the past four weeks on a four-point Likert scale (1 = never to 4 = often). The scale has been reported to have good validity and reliability (Russell, 1996).

We measured bullying victim experience with a bullying victimization questionnaire (Wolke & Sapouna, 2008). The questionnaire measured the frequency and the duration of direct and relational bullying victim experience in a school context during childhood and in a home and work context during adulthood. Frequency was measured with a five-point Likert scale (0: never; 1: once or twice; 2: occasionally; 3: about once a week; 4: several times a week). Participants who answered "never" in the frequency question were not given the duration question. Duration was measured with a five-point Likert scale (1: a few days; 2: several weeks; 3: several months; 4: several years; 5: it is ongoing). An average score ranging from 0 to 5 was created from the frequency and duration scores. This score was used to indicate the bullying victim experience at school, home, and work and for further statistical analyses.

Child abuse experience before the age of 16 was measured with a self-report questionnaire developed based on a semi-structured interview from the NEMESIS study (Janssen et al., 2004). Child abuse experience consisted of emotional, psychological, physical, and sexual abuse. Participants were asked to indicate with a yes or no answer if they ever experienced abuse according to a given definition that was presented (e.g., emotional abuse: "This means for example that people at home didn't listen to you, that your problems were ignored, that you had the feeling of not being able to find any attention or support from the people in your house") and to rate the frequency of the experience on a six-point Likert scale (0 = never to 5 = very often).

Negative schemas were measured using the Brief Core Schema Scales (BCCS; Fowler et al., 2006). The scale consisted of negative-self schema and negative-others schema subscales with six items for each subscale (e.g., negative-self schemas: "I am unloved;" negative-others schemas: "Other people are hostile"). The scale has been reported to have good validity and reliability (Fowler et al., 2006). In this study, the original format of BCCS was slightly modified due to technical reasons into a five-point Likert scale (1: No, do not believe it, 2: Yes, believe it slightly, 3: Yes, believe it moderately, 4: Yes, believe it very much, 5: Yes, believe it totally).

Symptom Measures. An Indonesian version of the Community Assessment of Psychic Experience (CAPE, (Jaya, 2017; Stefanis et al., 2002) was used to measure psychotic symptoms. Specifically, 20 positive symptom items and 14 negative symptom items were used. Participants were asked to rate symptom frequency during the past four weeks on a four-point Likert scale (1 = never to 4 = nearly always). The multidimensional model of the CAPE was used because it has been shown to have better factorial validity than the original three-dimensional model (Schlier, Jaya, Moritz, & Lincoln, 2015). Confirmatory factor analysis (CFA) showed that bizarre experiences, hallucinations, paranoia, grandiosity, and magical thinking load into a positive symptom factor, while social withdrawal, affective flattening, and avolition load into a negative symptom factor (Schlier et al., 2015).

A nine-item Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001) was used to measure depression symptoms. A seven-item Generalized Anxiety Disorder-7 scale (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006) was used to measure anxiety symptoms. On both scales, participants were asked to rate the presence of the symptoms during the past four weeks on a four-point Likert scale (1 = not at all to 4 = nearly every day). Both scales are based on the DSM-IV criteria. The published Indonesian versions of the questionnaires were used (available in www.phqscreeners.com).

Statistical Analyses. All data were analyzed using SPSS version 20. All tests were set as a two-tailed test, with level of significance set at $p < .05$. T-test was performed to compare urban and non-urban

groups on continuous variables, such as age, income, loneliness, bullying victim experience, abusive experience, negative schema, and symptoms of psychosis, depression, and anxiety. Mann–Whitney U test was performed to compare groups on ordinal variables, such as education and job. Sex, lifetime mental health diagnosis, and lifetime schizophrenia or other psychosis diagnoses were analyzed using Pearson's chi-square.

Results

Participant characteristics

The participants were 29.55 years old on average, and 74.8% were male. The largest socioeconomic category of the participants was university graduates (46.8%), working as a trained or skilled worker (23.8%), and had an income with a range of Rp1,000,000–Rp3,000,000 (36.7%). Moreover, 24.1% of the participants reported having a lifetime mental disorder diagnosis, and 1.1% participants reported having a lifetime diagnosis of schizophrenia or a psychotic disorder. Approximately half of the participants lived in urban areas ($n = 466$, 56.1%). When comparing urban versus non-urban dwelling participants, we found that non-urban

dwelling participants were significantly younger (age, $t[680.460] = -4.11$, $p < .01$), richer (income, $t[830] = -2.49$, $p < .05$), more educated (education, $U = 96,316.500$, $p < .01$), and have overall higher SES ($U = 93,813.00$, $p < .05$). The urban and non-urban samples also differed on sex ($\chi^2 [1, N = 832] = 14.42$, $p < .01$) and lifetime mental disorder diagnosis ($\chi^2 [1, N = 832] = 9.03$, $p < .01$). Specifically, the proportion of male participants was higher in urban (44.7%) and non-urban areas (30%). Also, participants who lived in urban areas (15.7%) tended to have a higher rate of lifetime mental disorder diagnosis than participants living in non-urban areas (8.4%). No significant difference was found in the rates of schizophrenia and other lifetime psychotic disorder diagnosis between urban (1%) and non-urban areas (0.1%), although urban areas showed a higher number of cases compared with non-urban areas.

Urban and non-urban differences in mental health risk factors and symptoms of psychosis, depression, and anxiety

Analyses on mental health risk factors and clinical symptoms showed that participants living in urban areas had a significantly higher score on measures of loneliness ($t[830] = 3.65$, $p < .01$).

Table 1. Urban vs. non-urban differences in mental health risk factors and symptoms of anxiety, depression, and psychosis (N = 832; urban, n = 466; non-urban, n = 366)

Variables	All Sample M(SD)	Urban M(SD)	Non-Urban M(SD)	t Value	p-value	Effect Size (Cohen's d)
Loneliness	2.14 (0.52)	2.20 (0.52)	2.10 (0.51)	3.65	< 0.001**	0.19
School Bullying	1.88 (0.95)	1.90 (0.98)	1.85 (0.91)	0.74	0.457	0.05
Home Bullying	1.57 (0.74)	1.62 (0.80)	1.51 (0.66)	2.26	0.024*	0.15
Work Bullying	1.62 (0.78)	1.65 (0.80)	1.59 (0.75)	1.16	0.247	0.08
Emotional Abuse	0.93 (1.26)	0.96 (1.27)	0.90 (1.26)	0.62	0.535	0.05
Psychological Abuse	0.80 (1.19)	0.80 (1.21)	0.78 (1.16)	0.20	0.839	0.02
Physical Abuse	0.59 (0.92)	0.58 (0.90)	0.62 (0.95)	-0.63	0.532	0.04
Sexual Abuse	0.24 (0.66)	0.24 (0.68)	0.25 (0.63)	-0.17	0.867	0.02
Child Abuse	0.99 (1.04)	1.00 (1.02)	0.99 (1.05)	0.15	0.878	0.01
Negative-self schemas	1.70 (0.86)	1.78 (0.91)	1.59 (0.77)	3.25	< 0.001**	0.23
Negative-others schemas	1.71 (0.78)	1.80 (0.83)	1.61 (0.71)	3.43	< 0.001**	0.25
Positive Symptoms	1.72 (0.45)	1.76 (0.46)	1.67 (0.44)	2.92	0.004**	0.20
Negative Symptoms	2.00 (0.49)	2.02 (0.50)	1.97 (0.46)	1.35	0.177	0.10
Depression	1.87 (0.56)	1.90 (0.55)	1.82 (0.57)	2.01	0.045*	0.14
Anxiety	1.78 (0.64)	1.81 (0.64)	1.74 (0.63)	1.64	0.101	0.11

Note. *significant at $p < .05$; **significant at $p < .01$; effect size (Cohen's d) is defined as follows: 0.20 is small, 0.50 is medium, and 0.80 or above is large.

School bullying = bullying victim experience at school; **Home Bullying** = bullying victim experience at home; **Work bullying** = bullying victim experience at work; **Emotional Abuse** = emotional abuse experience during childhood; **Psychological Abuse** = psychological abuse experience during childhood; **Physical Abuse** = physical abuse experience during childhood; **Sexual Abuse** = sexual abuse experience during childhood; **Positive Symptoms** = positive symptom of psychosis; **Negative Symptoms** = negative symptom of psychosis; **Depression** = depressive symptoms; **Anxiety** = anxiety symptoms

.01), bullying victim experience at home ($t[828.276] = 0.024, p < .05$), negative-self schema ($t[825.140] = 3.25, p < .01$, negative-others schema ($t[823.181] = 3.43, p < .01$), positive symptoms ($t[830] = 2.92, p < .05$), and depression ($t[830] = 2.01, p < .05$). Detailed results are provided in Table 1.

Discussion

Main findings

This study aimed to test whether participants who live in urban and non-urban areas would show differences in symptoms of psychosis, depression, and anxiety, as well as mental health risk factors. In general, this study found that the two groups were significantly different in several measures of symptoms and mental health risk factors. Participants living in urban areas showed a significantly higher level of positive symptoms and depression. They also showed a significantly higher level of loneliness, bullying victim experience at home, negative-self schema, and negative-others schema. Participants also differed in terms of demographic characteristics and mental health history. Participants living in non-urban areas were significantly older and had a higher income, education, and socioeconomic status. Also, participants living in non-urban areas had a lower number of cases of lifetime mental diagnosis. However, the rates of lifetime diagnosis of schizophrenia were similar among participants living in urban and non-urban areas.

Consistent with previous studies (Coid et al., 2017; Lundberg et al., 2009; van Os et al. 2001), we found that prevalence of PEs was higher among city dwellers, specifically, they had positive symptoms during the past four weeks. Evidence of elevated PEs in urban community was useful because symptoms of psychosis were hypothesized to be part of the schizophrenia continuum (Johns & van Os, 2001) and might serve as an indicator of 'psychosis proneness' in the general population (van Os et al., 2001). Consistent with previous studies (Lundberg et al., 2009; Lu, 2010), we also found that participants living in the city also experienced higher symptoms of depression. However, we found no significant difference in the number of lifetime diagnosis of schizophrenia and other psychotic disorders between participants living

in urban and non-urban areas. This finding is contrary to previous studies that found that urbanicity was associated with a higher lifetime diagnosis of psychosis (Kelly et al., 2010; Pedersen & Mortensen, 2001; Sundquist et al., 2004; van Os et al., 2001; Vega, Kolody, Agutlar-Gaxtola, Alderete, Catalano & Caraveo-Anduaga, 1998),

With regard to mental health risk factors, people living in urban areas reported higher levels of loneliness, bullying victim experience at home, and negative schema. To our knowledge, no study has examined the direct association between urbanicity and risk factors for mental disorders related to adverse social experiences (e.g., bullying victim experiences, child abuse), loneliness, and negative schema. However, the differences between the urban and non-urban areas in terms of risk factors are understandable. Adverse social experiences, loneliness, and negative schema may be related to characteristics of the urban social environment, such as high social isolation, low collective efficacy, high social segregation, high number of accidents, violence, and high crime rates (Gruebner et al., 2017). Urban areas are also associated with a concentrated low socioeconomic status (Gruebner et al., 2017), which was also observed in our sample.

Strengths and limitations

To our knowledge, this study is among the first that explores the association between urbanicity and mental health condition with an Indonesian sample. This study includes not only the lifetime diagnosis of mental health problems but also measures of symptoms and common risk factors. The inclusion of symptoms and risk factors provides an opportunity to further explore possible explanations for different rates of mental disorders between urban and non-urban residents. On the basis of our findings, the higher rates of diagnosis and symptoms of mental disorders in an urban sample may be explained by the higher number of common risk factors for mental disorders associated with living in an urban area.

This study has several limitations. First, the accuracy of the participants' lifetime mental health diagnosis cannot be ascertained because it is only based on the participants' self-report.

Specifically, the reported prevalence rates may be underestimated due to stigma surrounding mental health diagnosis. In addition to the underestimation of the rates of mental health diagnosis, a statistical power issue exists, which may explain the lack of significant difference in the rates of schizophrenia and other psychotic diagnosis between urban (1%) and non-urban (0.1%) areas, even though the difference is tenfold. As a result of our sample size, most of the significant differences between urban and non-urban participants were based on small effect sizes. Therefore, careful interpretation of urban and non-urban differences is warranted.

Second, in this study, urbanicity was conceptualized as the current place of residence. Aside from place of residence, urbanicity is also commonly defined in terms of place of birth (Marcelis, Takei, & van Os, 1999), environment during upbringing and the cumulative effect of time (Pedersen & Mortensen, 2001; Vega et al., 1998), population density (van Os et al., 2001), or population size (Breslau, Marshall, Pincus, & Brown, 2014). Although the association between urbanicity and the prevalence of disorders is robust regardless of the definition of urbanicity (Vassos et al., 2012), future studies should take into account the specific definition of urbanicity. Also, because the survey was administered online, online sampling bias may limit the generalizability of the findings. Unlike most samples, the non-urban participants in our study were older and had a higher level of income and education, thereby indicating that we mostly recruited the privileged segment of the non-urban population.

Third, measures of common risk factors included in this study were limited to the risk factors operating on the individual level, such as loneliness, bullying victim experience, childhood abuse experience, and negative schema. Future studies should include measures of risk factors operating on the area level related to the sociodemographic and neighborhood social characteristics of urban and non-urban environments. Future studies should also take sociodemographic factors into account when comparing urban and non-urban characteristics.

Conclusion

Our findings were similar to those of studies conducted in developed countries. We found that participants who live in urban environments seem to have poorer mental health in comparison to participants who live in non-urban environments. One explanation for this finding could be that urban dwellers in our sample were living in poorer socioeconomic conditions, felt lonely, experienced bullying, and had higher levels of negative schema. The findings from this study could be used as a basis to promote prevention and psychoeducation programs, as well as mental health screening for people living in urban areas, especially for those who live in high-risk neighborhoods.

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Ethical statement

This study received approval from the ethical commission of the German Psychological Society and was carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki).

Declaration of Conflicting Interests

The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

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