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Adverse Childhood Experiences and Depression among Indonesian University Students

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ABSTRACT

The prevalence of mental health problems, including depression, among university students was high. Previous studies showed that adverse childhood experiences was among factors that contribute to the course of depression. Individuals with more adverse childhood experiences had more vulnerability to have depression symptoms in their later life. This study was aimed to describe the adverse childhood experiences and depression among university students and to investigate the role of adverse childhood experiences to depression. Data were collected from 419 students of Diponegoro University. The subjects filled the Adverse Childhood Experiences Questionnaire and Beck Depression Inventory II (BDI-II). Data were analyzed using descriptive and correlation analysis as well as Receiver Operating Curve (ROC) and odds ratio computation. The result showed that subjects had zero to seven adverse childhood experiences and the average score of depression is 13,22 (*SD*=6.998). Using cut-off score at 17, the data showed that the prevalence of depression among subjects was 27.7%. Both variables in the study were significantly correlated (*Spearman's rho*= .266; *p*< .0001), supporting previous studies in general population. The Area Under the Curve (AUC) of adverse childhood experiences as predictor of depression was 61.9%. Odds ratio of individuals with minimum one adverse childhood experience was 2.481 (95% CI; 1.602 – 3.843). The result offers an additional understanding to mental health problems, particularly depression, among university student. Further implication of this findings for mental health program in university is discussed.

***Keywords**: adverse childhood experiences, depression, mental health problems, university students*

INTRODUCTION

Mental health problems at the developmental transition from adolescence to adulthood was prevalent. In particular, previous studies showed high prevalence of mood disorders, anxiety disorders, and substance use disorders among adolescents[1,2] and young adults. Depression becomes one among other mental health problems which needs special attention because of its risk to suicide attempt and other health-related problems[3]. College students as indivuals experiencing transition from adolescence to adulthood also prone to mental health problems, including depression[4–7]. The depressive symptoms used to be expressed through social media like facebook[8]. Depression among college students could negatively affect not only health-related condition but also academic development.

Several factors were associated with the course of depression, including adverse childhood experience[9–11]. Adverse childhood experience (ACE) was a commonly used indicator in public health surveillance. It consisted of but not limited to experience of abuse (emotional, physical, sexual); neglect (emotional, physical); witnessing domestic violence, having family members abuse alcohol or drugs or have mental illnesses, parental separation or divorce, or having family members with criminal behaviors[12]. ACE could be an obvious marker to develop early prevention to foster children for having more severe effect in their later life.

Many studies were done regarding association between ACE and depression. It showed that having more adversity experiences during childhood increases the risk of having depressive symptoms[13,14] or depressive

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disorder[9,10] or risky behavior related to depression such as alcohol or drug abuse, smoking, risky sexual behavior, self-injurious behavior, and suicide attempt[13–16] in later developmental stage. Most of those studies involved adult participants. The study on younger samples such as adolescence or younger adult was available but still limited[11,14], particularly in developing countries setting[15–17]. Considering the importance of passing through developmental transition and succeding the academic process in college or university, study about the role of ACE to the emergence of depressive symptoms and depressive disorder with college students sample was needed.

This study aimed to describe the ACE and depressive symptoms among university students and examine the risk level of having depression among those experiencing adversities during their childhood. The hypothesis of the study is the more adversities experienced during childhood, the more probability or risk for having depression.

METHOD

Subjects and procedures: The subjects comprised 419 undergraduate students from Diponegoro University, Semarang, Indonesia. The subjects were from four faculties in the university. Prior to data collection, the researchers sent a letter for asking permission to the dean of each faculty to conduct the research. Aproval from the dean was then followed by coordination with academic vice dean about which class was able to be involved in the study. Subjects consented to participate in the study filled the quetionnaires classically with guidance from researchers' team. Of the sample, the age of the subjects range from 18 to 20. Majority of the sample were female (73%).

Measures: Adverse Childhood Experiences Questionnaire was used to measure the type and number of adversities experienced by subjects during their childhood. It consisted of 12 items, asking about childhood adversities during respondent's first 18 years of life. The twelve items were representing childhood adversities, including abuse (emotional, pphysical, and sexual), neglect (emotional and physical), domestic violence, parental separation or divorce, alcohol or substance abuse problems in family, mental health problems in family, incarcerated family members, bullying, and loss of parent(s). The ACEs Questionnaire was administered in self-report technique and sored by 0 or 1, resulting in total score ranging from 0 to 12. Zero indicating subject was not experiencing the adversity and 1 indicating subject had that kind of adversity experience. The samples of the items were *"Were you bullied?"* and *"Did your parents (father/mother) die?"*.

Beck Depression Inventory-II/BDI-II was self-reported questionnaire used to measure depression level of individuals. It consisted of 21 items. The BDI-II was among most frequently used questionnaire to measure depression around the world, both in general and clinical setting. The subject were asked to choose among groups of statements (multiple choice) that best describe their condition for the last two weeks. Each item scored from 0 to 3. The total score were summative score of all items, ranging from 0 to 63 which indicate the level of depression. The BDI-II had been adapted in many languange. This study used Bahasa Indonesia version of BDI-II with satisfactory reliability and validity. Cronbach's alpha in this study was .83. The cut-off used in this study was 17 to detect clinical level of depression, as recommended by study in Indonesia. The sample item of BDI-II was *"I am sad all the time"* and *"I feel my future is hopeless and will only get worse"*.

DATA ANALYSIS

The data in this study were analyzed using Statistical Package of Social Science (SPSS) for Windows version 20.0. Descriptive and non-parametric correlational analysis were employed. In addition, t-test, odds ratio and Receiver Operating Curve (ROC) were computed.

RESULTS AND DISCUSSIONS

The demographic data of the subjects were presented in Table 1. It showed that most of the subjects were female (73%), Javaness ethnic group (76%). The age of the sample ranged from 18 to 20 with mean age 18.61 (*SD*= .607). The GPA ranged from 1.89 to 4 with mean 3.39 (*SD*= .37) for 4 point grade. The number of adversity experienced by subjects ranged from 0 to 7. Most of the subjects claimed to have none of adverse childhood experiences (54.2%), followed by one adverse childhood experiences during theori first 18 years of life (30.1%). The score of depression level using BDI-II was ranged from 1 to 39 (*M*= 13.22; *SD*= 6.998). Using cut-off 17, a number of 118 (28.2 %) of the subjects were found to have clinical depression.

A t-test and One-Way ANOVA or Kruskal-Wallis test were conducted to see the differences on variables of interest based on demographic data. The differences based on gender were observed on ACEs score (t[416]= -2.959; p= .03), but not in BDI-II score (t[416]= -.120; p= .904). Male students had higher average ACE score than female students. Based on ethnicity, there were significant differences in BDI-II score (F[2]= 5.116; p= .006), but not in ACEs score (λ^2[2]= 4.518; p= .104). The multicultural goup was found to have highest depression score, followed by non javanese ethnic group, and javanese ethnic group. The differences was observed in ACEs score based on study major (λ^2[3]= 25.995; p< .0001), but not in BDI-II score (λ^2[3]= 6.190; p= .103). Non-parametric correlational analysis then employed between variables of interest and age. There was no correlation between both ACEs score and BDI-II score with age (*Spearman's rho*= -.007; p= .665.; *Spearman's rho*= -.021; p= .892). The correlation was also not found between BDI-II score with GPA (*Spearman's rho*= -.063; p= .209). But, the correlation was observed between ACEs score and GPA (*Spearman's rho*= -.121; p= .015).

Regarding adversity type, the most common adversity experienced by subject was bullying (33.2%), followed by emotional abuse (8.8%), physical abuse (6.9%), and parents passed away (6.9%). The most common depression symptoms observed in the subjects was change in sleep pattern, followed by guilty feelings, self-criticalness, agitation, and change in appetite. The complete descriptive data for adverse childhood experiences and depression were displayed in Table 2 and Table 3.

Table 1: Demographic data (gender, ethnicity, faculty), ACEs score, and depression score of samples (n = 419)

Category	f	%	ACEs Mean (SD)	BDI-II Mean (SD)
Gender				
Female	305	73	.67 (1.11)	13.19 (6.97)
Male	113	27	1.04 (1.21)	13,28 (7.12)
Missing data	1			
Ethnicity*				
Javanese	316	76	.72 (1.13)	13.04 (6.83)
Non Javanese	87	20.9	.78 (1.07)	13.06 (7.09)
Bicultural or multicultural	13	3.1	1.54 (1.56)	19.31 (8.75)
Missing data	3			

Conted…

Study major				
Psychology	93	22.2	1.38 (1.56)	15.29 (8.43)
Engineering	59	14,1	.56 (.95)	12.75 (6.49)
Sains and mathematics	157	37,5	.64 (.99)	12.57 (6.43)
Public health	110	26,3	.53 (.82)	12.65 (6.44)

**Ethnic group were divided into three categories to simplicize the data. Non javanese ethnic group consists of many ethnic groups other than Javanese and was computed together because of the small number of each.*

The non-parametric correlational analysis using Spearman rho test was employed to examine the relation between ACE and depression. The result showed that there was positive correlation between adverse childhood experiences and depression (*Spearman's rho*= .266; p< .001). Therefore, the more adversity experiences by subjects during their childhood, the more depression level was observed among subjects. In terms of sesitivity and specificity, the ROC analysis showed that measurement of ACEs had Area Under Curve (AUC) of .626 (95% CI; .566 - .687), meaning that 62.6% prediction using ACE score was correct. The recommended cut-off point was .5 (or rounded to 1). Using the recommended cut-off points, ACEs questionnaire could predict correctly 61.9% of subject with clinical depression as having depression (sensitivity level) and 39.5 % of subjects without clinical depression as having normal depression level (spesificity level). Odds ratio of individual with at least one adverse childhood experience to have depression in their early adulthood was 2.481 (95% CI; 1.602 – 3.843). It could be interpreted that individual with adversity experience during their childhood, even only one, would have 2.5 times risk higher than others to have depression in their later life.

Table 2: Prevalence of adverse childhood experiences' types among samples (n = 419)

ACE	f	%
Emotional abuse	37	8.8
Physical abuse	29	6.9
Sexual abuse	9	2.1
Emotional neglect	24	5.7
Physical neglect	6	1.4
Living in family with parents separated or divorced	12	2.9

Conted…

Living in family with domestic violence	7	1.7
Living with family member with alcohol or substance abuse problem	5	1.2
Living with family member with mental health problems	13	3.1
Having incarcerated family member	10	2.4
Bullying	139	33.2
Parent(s) passed away	29	6.9

Table 3: Prevalence of depressive symptoms among samples (n = 419)

Items	Score 0	Score 1-2-3
Sadness	196 (46.8%)	223 (53.2%)
Pessimism	293 (69.9%)	126 (30.1%)
Past failure	251 (59.9%)	169 (40.1%)
Loss of pleasure	230 (54.9%)	189 (45.1%)
Guilty feelings	60 (14.3%)	359 (85.7%)
Punishment feelings	250 (59.7%)	169 (40.3%)
Self-dislike	262 (62.5%)	157 (37.5%)
Self-criticalness	124 (29.6%)	295 (70.4%)
Suicidal thoughts or wishes	385 (91.9%)	34 (8.1%)
Crying	295 (70.4%)	124 (29.6%)
Agitation	129 (30.8%)	290 (69.2%)
Loss of interest	239 (57%)	180 (43%)
Indecisiveness	213 (50.8%)	206 (49.2%)
Worthlessness	325 (77.6%)	94 (22.4%)
Loss of energy	170 (40.6%)	249 (59.4%)
Changes in sleep pattern	39 (9.3%)	380 (90.7%)
Irritability	229 (54.7%)	190 (45.3%)
Changes in appetite	131 (31.3%)	288 (68.7%)
Concentration difficulty	182 (43.4%)	237 (56.6%)
Tiredness or fatigue	137 (32.7%)	282 (67.3%)
Loss of interest in sex	351 (83.8%)	68 (16.2%)

Note: Five most common symptoms were displayed in bold

The results of this study supported previous study both in developed and developing country settings that ACE became a risk factor for mental health problems during adolescence and early adulthood[10–15,17]. When individual with history of ACE was experiencing chronic stress during adolescence, there would be higher response on hipotalamus pituitary adrenal (HPA), resulting more elevated and prolonged cortisol[3]. This enhanced HPA activity become one factor of the emergence of depression among uniersity students.

The most common childhood adversities experienced by subjects in this study was bullying. It supported previous study about the high prevalence of bullying at school[18], and showed the dangerous effect of it. Bullying, especially during childhood and early adolescence was like a crisis situation for children because peer acceptance was very essensial for them. The second common childhood adversities found in this study was emotional abuse. The example of emotional abuse was insult, humiliation, and action in the way which put children down or make children afraid of physically hurt. Those kinds of behavior were often observed among parents. They might not aware of the effect of their behaviors. Children experiencing emotional abuse had their trust to the very closed person in their life broken. With their basic trust broken, it would be more difficult to trust another people, resulting in difficulty to relate with other. Children experiencing emotional abuse would also had low self-esteem and easy to blame themselves for failure.

In line with the findings about ACE, the most common depressive symptoms found in this study were chenge in sleep pattern, guilty feelings, self-criticalness, agitation, and change in appetite. The first common symptom was about sleep disturbance, representing somatic symptoms. This symptom indicated that subjects was very tense and stressed. The disturbace in sleeping patter could expressed in hypersomnia or insomnia. Both of them were indicators of tension and stress. This findings was similar to study among US young adults which showed 57% prevalence of sleep disturbance[19]. The later depressive symptoms were highly associated with low self-esteem. Individuals with low self-esteem were very easy to feel guilty eventhough they were not guilty. The guilty feeling was usually accompanied by self-critical, such as doing overevaluation to themselves all the time. This overevaluation also made individuals agitated. Change in appetite as another somatic symptom could also appear when individuals in tese and stress.

The prevalence of clinical depression among university students in this study was 28.2%. The depression level did not differ across gender or study major, but differed by ethnicity. The students with

multicultural ethnic and non javanese ethnic were shown to have higher licel of depression. This could be because they need cultural adaptation when study in Central Java with javanese ethnicity as majority. This finding was different from previous study that usually found gender differences on depression.

The difference based on gender was observed in ACE score with higher score on male. It was also different with previous study that usually showed female as more vulnarable to have childhood adversity because of gender inequality.Further study was needed to explore this finding.

The main result in this study was about the correlation between ACE and depression the odds ratio based on the recommended cut-off from ROC analysis. The odds ratio found in this study was similar to the study among adults[9]. The positive correlation found between both variables was supported by previous study that ACE was a risk factor of depression. The more childhood adversities experienced by individuals, the more depression level individuals would have. This finding confirmed that the risk was exist even since adolescence.

The higher risk of having depression among university students with at least one ACE implies the need for all kinds of intervention, including preventive, curative, and rehabilitative. The preventive action was compulsory in childhood stage. Effective programs need to be implemented to prevent more children experiencing adversities and prevent more adversities experienced by children[12]. The curative and rehabilitative programs could be done by university through counseling and mental health promotion programs[20].

Despite the important findings in this study, it has several limitations. First, this study used convenient sampling with representation from several faculties or study majors. Further study could use random or systematic sampling to get more representative prevalence and odds ratio. Second, this study was a cross-sectional study with ACE measured retrospectively. Although retrospective method was recommended fo population-based study[12], there was a risk of bias based on the dispositional condition of the subjects[21]. Prospective method to measure ACE could be used to get a more objective result. Third, further study could expand the investigation by involving more variable, including predictor variables and outcome variables.

CONCLUSIONS

The ACE and depressiom were common among university student. Having at least one adverse childhood experience could increase the risk of having depression to 2.48 times. With this risk, students would need more support and guidance in dealing with both academic and con academic stressors during their study in university.

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Conflict of Interest: The authors declares that there is no conflict of interest.

Ethical Clearance: All participants were signed the informed consent prior to the data collection.

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