

Depression Prevalence in Urban Indonesia: a Preliminary Study of the Makassar General Population

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ABSTRACT

Introduction: The prevalence of depression in South Sulawesi has been reported to exceed the national average. This preliminary study investigated the prevalence of depression in Makassar, the capital city of South Sulawesi.

Methods: A total of 64 volunteers from the general population were enrolled for cross-sectional observational study using convenience sampling. The CES-D questionnaire was used to assess depressive symptoms, and sociodemographic data were also collected. The main analysis was conducted using a generalized linear model (GLM).

Results: The results showed that the mean CES-D score was 16.34 ± 10.30 , and the prevalence of screen-positive mild-to-severe depressive symptoms was 65.6%. CES-D scores varied significantly by age ($p = 0.026$), ethnicity ($p = 0.004$), and education ($p = 0.041$).

Discussion: However, in the multivariate analysis, ethnicity remained statistically associated with depressive symptoms, with participants of Makassar ethnicity observed to report lower levels of depressive symptoms compared with other ethnic groups. This preliminary finding may suggest a context-specific association between cultural identity and lower depression scores.

Conclusion: These findings provide preliminary information that requires further investigation through large-scale observational studies to examine the association between ethnicity and depression, particularly in urban settings characterized by emerging multiethnic identities.

Keywords: Depression, Ethnicity, Makassar, Indonesia, Urban mental health

Introduction

Indonesia has been widely reported to have a substantial prevalence of depression, as evidenced by numerous observational studies conducted across various populations and regions of the country [1–10]. The prevalence reported is relatively high and, in some cases, comparable to or even exceeding estimates from other Southeast Asian countries [11,12].

The prevalence of depression in Indonesia is generally reported at the provincial level [13,14], with limited data available at the city level, particularly in urban settings. Makassar, as one of the rapidly growing metropolitan cities in South Sulawesi, represents an important context for examining depression prevalence.

Despite this, research on depression in South Sulawesi—particularly in Makassar—remains limited. The rapid acceleration of urbanization, shifts in the sociocultural landscape, and increasing demographic diversity accompanying the city's development may offer valuable perspectives for understanding the emerging patterns of depressive symptoms within this urban population [2,13,15,16].

Depression has been widely investigated in relation to sociodemographic (SD) characteristics [17,18], including within culturally and demographically diverse populations in Indonesia [1–3,7–9,11]. For instance, findings from studies conducted in Makassar indicate that income is significantly associated with

depressive symptoms [19], whereas no meaningful gender differences have been identified [20]. The authors of these studies suggest that such associations may be shaped by broader sociocultural dynamics inherent to urban environments, including rapid urbanization, evolving cultural norms, and growing demographic heterogeneity. This perspective is further supported by research examining self-construal and depressive symptoms among residents of Makassar [21], which indicates that cultural orientations may influence how depressive symptoms are experienced, interpreted, and expressed within this urban population.

Therefore, this study was designed as a preliminary investigation to examine the prevalence of depressive symptoms within an urban context, using Makassar City as a case example. In addition, this study aimed to explore the association between sociodemographic factors and depression scores among urban residents. Based on the evidence from previous studies, it is assumed that the manifestation of depressive symptoms in this population may be context-dependent, shaped by the unique sociocultural dynamics of urban living.

Methods

Study design and Setting

This was a preliminary observational study using a cross-sectional design conducted in Makassar City, South Sulawesi, Indonesia. The reporting of this study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines (<https://www.strobe-statement.org/>). South Sulawesi is a province that has reported a comparatively high prevalence of depression [13,14], and as its capital, Makassar may contribute substantially to this estimate.

Participants

A total of 64 residents of Makassar voluntarily participated in this study. The sample was drawn from the general population using a convenience sampling method. The inclusion criteria required that participants had been residents of Makassar for at least 10 years and were a minimum of 15 years of age at the time of data collection. Eligible individuals were then invited to participate after receiving an explanation of the research objectives and procedures, and those who agreed provided written informed consent.

CES-D

Depressive symptoms were assessed using the Center for Epidemiologic Studies Depression Scale (CES-D) [22]. This instrument is valid and widely used for measuring depressive symptomatology in the general population [4,22–24]. The CES-D consists of 20 items assessing how frequently individuals experienced specific symptoms (e.g., “I was bothered by things that usually don’t bother me”) during the past week. Each item is rated on a 4-point Likert scale ranging from 0 (rarely or none of the time) to 3 (most or all of the time). The internal consistency reliability of the CES-D in this study was 0.80. Following the established scoring criteria, CES-D total scores were categorized into: no depression (0–9), mild depression (10–15), moderate depression (16–24), and major/severe depression (≥ 25) [24]. These cut-offs were selected to maintain comparability with prior Indonesian population studies using the CES-D [1,3,5].

Sociodemographic (SD)

Sociodemographic data included basic respondent information such as age, sex, ethnicity, educational attainment,

occupation, and monthly household income. Age was categorized into four groups: 15–30, 31–45, 46–60, and 61–75 years. Educational attainment was classified into four levels: elementary school or below, secondary school, diploma, and bachelor’s degree or higher. Occupational status included housewife, private-sector worker, and student; categories with low frequencies were combined and classified as “others.” Monthly household income was categorized as <IDR 1,000,000; IDR 1,000,000–2,000,000; IDR 2,000,000–3,000,000; IDR 3,000,000–5,000,000; and IDR 5,000,000–7,500,000. Ethnicity was classified into major ethnic groups (i.e., Makassar, Bugis, and Toraja), mixed Bugis–Makassar ethnicity, and a minority category labeled “others.” Any missing or unreported information was categorized as “unknown.”

Procedures

Participants who provided consent then underwent a face-to-face interview conducted by a trained field enumerator, which lasted approximately 10–15 minutes. Prior to data collection, all field enumerators completed a standardized trainer-of-trainers (ToT) training to ensure they fully understood and properly executed study procedures, interviewing techniques, and data-collection protocols.

Data analysis

The reliability of the CES-D scale was assessed using Cronbach’s alpha (α). Data were analyzed descriptively using proportions (n and %) and measures of central tendency (mean $\pm$ standard deviation). The Mann–Whitney U test and Kruskal–Wallis test were used to examine differences in CES-D scores across sociodemographic groups. To evaluate the associations between sociodemographic variables and depressive symptom scores at the multivariate level, a generalized linear model (GLM) was applied. All statistical analyses were conducted using IBM SPSS Statistics for Windows, Version 26.0 (IBM Corp., Armonk, NY, USA). A 95% confidence interval (CI) and a significance level of $\alpha = 0.05$ were used to determine statistical significance.

Ethical approval

This study received ethical approval from the Health Research Ethics Commission of the Faculty of Public Health, Hasanuddin University (Protocol No. 31025105045).

Results

Table 1 (see the next page) shows that the mean CES-D score among participants was 16.34 ± 10.30 . Based on established cut-off values, 34.4% of respondents were classified as having no depressive symptoms, while 23.4%, 18.8%, and 23.4% were classified as having mild, moderate, and major depressive symptoms, respectively. A smaller proportion of participants also demonstrated very high depressive symptom scores (CES-D >30 ; Figure 1). The mean age of participants was 30.73 ± 14.20 years, with individuals aged 15–30 years constituting the largest proportion of the sample (65.6%). Male and female participants were equally represented. Most participants identified as Makassar ethnicity (45.3%). The majority had completed secondary education (62.5%), were students or reported other occupations (34.4%), and reported a monthly income ranging from IDR 2,000,000 to 3,000,000 (21.9%).

Mean CES-D scores varied across sociodemographic characteristics (Table 2; Figure 2). Higher mean CES-D scores were observed among participants aged 15–30 years ($18.33 \pm$

Table 1 Respondent characteristics

Parameter	Frequency (N=64)
CES-D score	16.34±10.30
CES-D category	
No depression (0-9)	22 (34.4)
Mild depression (10-15)	15 (23.4)
Moderate depression (16-24)	12 (18.8)
Major depression (≥25)	15 (23.4)
Age (years)	30.73±14.20
Age (category, years)	
15–30	42 (65.6)
31–45	12 (18.8)
46–60	6 (9.4)
61–75	4 (6.3)
Sex	
Male	32 (50.0)
Female	32 (50.0)
Ethnicity	
Bugis	13 (20.3)
Makassar	29 (45.3)
Bugis-Makassar	13 (20.3)
Toraja	1 (1.6)
Others	8 (12.5)
Education	
Elementary school or less	11 (17.2)
Secondary school	40 (62.5)
Diploma	1 (1.60)
Bachelor or higher	12 (18.8)
Occupation	
Housewife	16 (25.0)
Private	2 (3.1)
Students	22 (34.4)
Others	22 (34.4)
Unknown	2 (3.1)
Household income (IDR; Monthly)	
<1,000,000	11 (17.2)
1,000,000 – 2,000,000	10 (15.6)
2,000,000 – 3,000,000	14 (21.9)
3,000,000 – 5,000,000	8 (12.5)
5,000,000 – 7,500,000	2 (3.1)
Unknown	19 (29.7)

Data were presented as mean ± standard deviation and n (%). CES-D = Center for Epidemiologic Studies Depression Scale. Missing or unreported responses were recorded as “unknown.”

10.82), males (17.43 ± 11.13), and those with secondary school education (17.52 ± 10.62). Participants identifying as Makassar ethnicity had the lowest mean CES-D score (12.72 ± 9.23) compared with other ethnic groups. Differences in CES-D scores across age categories, ethnicity, and educational attainment were statistically significant, whereas differences by sex, occupation, and household income were not statistically significant (Table 2 and Figure 2).

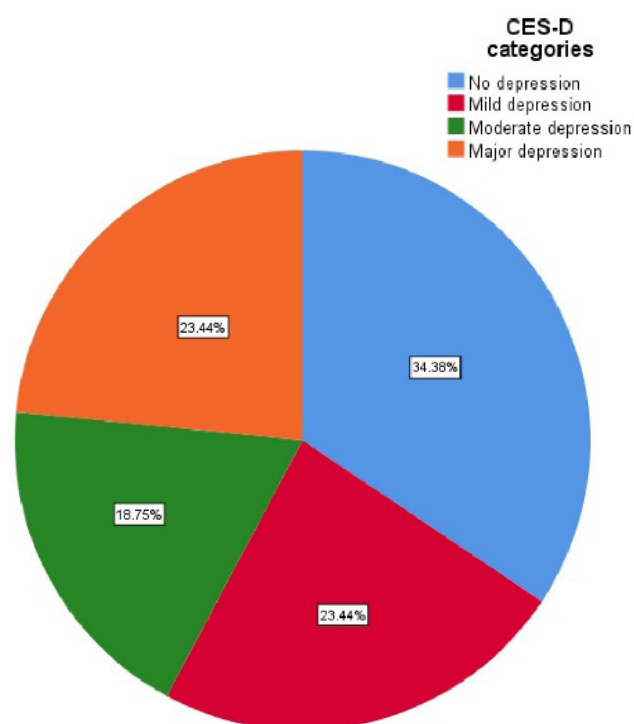
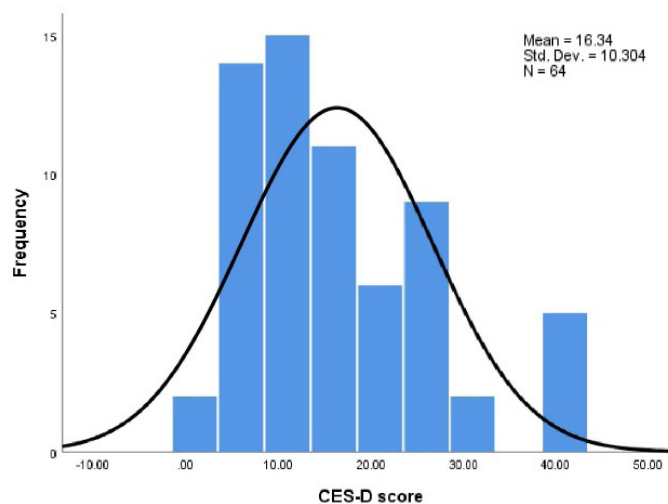


Figure 1 – CES-D mean score and categories

Table 3 presents the generalized linear model analysis examining the association between sociodemographic variables and CES-D scores. Ethnicity remained significantly associated with CES-D scores ($p=0.014$), whereas age, sex, educational level, occupational status, and income were not statistically associated with depressive symptom scores.

Discussion

This study represents a preliminary investigation of depression prevalence among residents of Makassar, using a small, exploratory sample of 64 participants to obtain an initial overview of depressive symptomatology within the population. The findings indicated a relatively elevated mean CES-D score (16.34 ± 10.30), suggesting a substantial proportion of participants screened positive for depressive symptoms. Surprisingly, 65.6% of the sample fell within the mild-to-severe depression categories. These findings are comparable to those reported in previous studies with larger sample sizes that employed the same CES-D instrument in general population settings [7,20]. As such, the observed estimates may provide a rough approximation

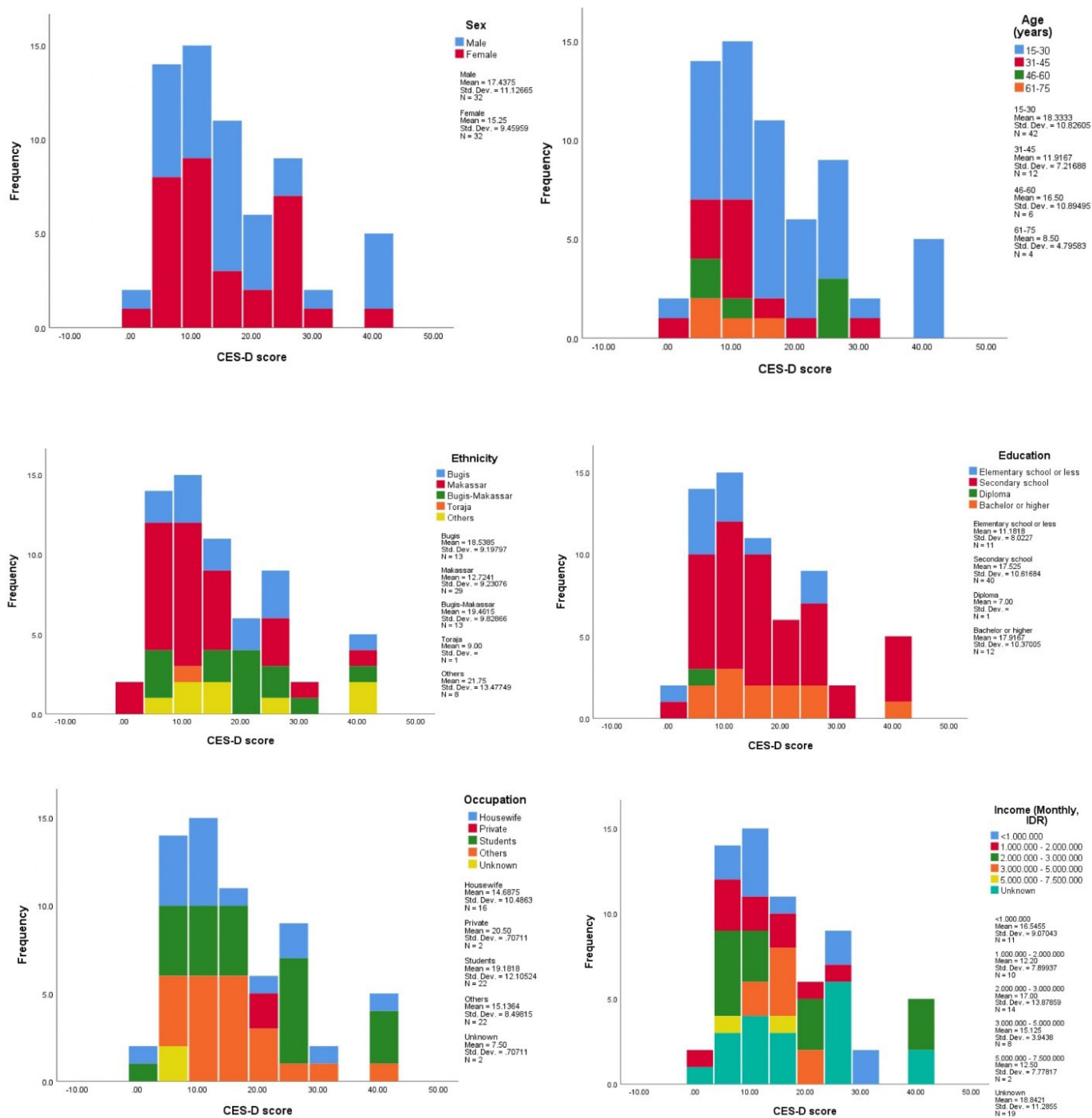


Figure 2 – Mean CES-D scores across respondent characteristics

of depressive symptom prevalence, despite being derived from a limited sample. However, these prevalence estimates should still be interpreted with caution. The use of convenience sampling may have influenced the demographic composition of the sample, particularly with respect to age and educational background, which may have resulted in overrepresentation within the estimates and limited the generalizability of the findings to the broader population. Moreover, the small sample size constitutes an important methodological limitation and should be carefully considered when interpreting the results. In addition, variability in CES-D cut-off scores across studies may contribute to differences in the classification and reported prevalence of depressive symptoms, further complicating direct comparisons with the existing literature [22–24]. For instance,

when threshold ≥ 16 was applied [4], the prevalence decreased to 42.2%. Nevertheless, the presence of a substantial proportion of participants with mild depressive symptoms, based on the established cut-off points used in the current study, may provide a valuable signal of early vulnerability to depressive symptomatology.

The high prevalence of depressive symptoms (i.e., CES-D scores) observed in this study appears to be partly attributable to differences in age, ethnicity, and educational attainment (see Table 2 and Figure 2). These sociodemographic (SD) factors have been well documented in previous research as sources of variation in depression prevalence [1–3, 7–9, 11]. Variation in CES-D scores across age groups may reflect the sensitivity of the instrument in general population samples, particularly

Table 2

Mean comparison of CES-D based on sociodemographic

Parameter	CES-Da	p	CES-Db	p
Age (category, years)				
15–30	18.33±10.82	NS	18.33±10.82	0.026
31–45	11.91±7.21		12.54±8.16c	
46–60	16.50±10.89			
61–75	8.50±4.79			
Sex				
Male	17.43±11.13	NS		
Female	15.25±9.46			
Ethnicity				
Makassar	12.72±9.23	0.043	12.72±9.23	0.004
Bugis	18.53±9.20		19.34±10.30	
Bugis-Makassar	19.50±9.83			
Others	20.33±13.30			
Education				
Elementary school or less	11.18±8.02	NS	11.18±8.02	0.041
Secondary school	17.52±10.62		17.41±10.46	
Diploma or higher	17.07±10.37			
Occupation				
Students	19.18±12.10	NS	19.18±12.10	NS
Private	20.50±0.71		14.85±9.03	
Housewife	14.68±10.48			
Others	15.13±8.49			
Unknown	7.50±0.71			
Income (IDR; Monthly)				
<1,000,000	16.54±9.07	NS	16.54±9.07	NS
1,000,000 – 2,000,000	12.20±7.90		16.30±10.62	
2,000,000 – 3,000,000	17.00±13.88			
3,000,000 – 5,000,000	15.12±3.94			
5,000,000 – 7,500,000	12.50±7.78			
Unknown	18.84±11.30			

Data are presented as mean ± standard deviation. CES-D = Center for Epidemiologic Studies Depression Scale; NS = not significant.

^a Kruskal–Wallis test was applied for comparisons involving more than two groups.

^b Mann–Whitney U test was applied for comparisons between two independent groups.

^c Mean values represent merged categories.

Missing or unreported responses were categorized as “unknown.”

among younger respondents, which could contribute to higher prevalence estimates. Notably, in multivariate analysis, ethnicity remained statistically associated with CES-D scores (Table 3), with participants identifying as Makassar ethnicity showing lower mean CES-D scores compared with other ethnic groups (Table 2). This is in line with a case–control study reporting a lower proportion of clinical depression among individuals of Makassar ethnicity compared to others, although the odds ratio was not statistically significant [19]. In fact, prior studies that directly examine the association between ethnicity and depression in Indonesia are limited, and no research to date has specifically investigated this association in Makassar. Given Indonesia’s long

Table 3

Tests of Model Effects

Sociodemographic	Type III		
	Wald Chi-Square	df	Sig.
(Intercept)	86.963	1	<0.001
Sex	0.075	1	0.785
Age	1.151	1	0.283
Ethnicity	6.058	1	0.014
Education	0.021	1	0.884
Occupation	0.962	1	0.327
Income	0.282	1	0.595

Dependent Variable: CES-D score

Generalized linear model

history of inter- and intra-cultural interaction within multiethnic settings—Makassar being one example, where several major ethnic groups coexist and the Makassar ethnic group remains the most dominant and inherently indigenous [25–28]—these preliminary findings may reflect context-specific sociocultural positioning related to depressive symptom expression, rather than indicating an inherent ethnic difference in depression risk.

A reasonable interpretation of this finding is that individuals of Makassar ethnicity may be situated within sociocultural contexts characterized by strong norms of tolerance and mutual responsibility, often reflected in the cultural values of *siri’ na pacce’*, which emphasize honor, social obligation, and empathy [29–32]. Although not designed to compare ethnic subgroups directly, prior research on self-construal in Makassar populations may offer contextual support for this interpretation, particularly regarding the predominance of interdependent self-construal patterns among Makassar residents [21]. Such cultural orientations may be relevant when considering observed differences in depressive symptom scores across ethnic groups. However, the interpretation of ethnicity-related differences should be approached with caution. Cultural values associated with *siri’ na pacce’* are not exclusive to the Makassar ethnic group and are also embedded within Buginese culture. Moreover, the major ethnic groups in South Sulawesi, including Bugis, Makassar, and Toraja, share long-standing historical, cultural, and social interconnectedness. This cultural overlap may blur distinct ethnic boundaries and complicate the attribution of mental health differences to ethnicity alone. Therefore, the observed association may reflect broader sociocultural positioning rather than discrete ethnic characteristics.

Consequently, this finding warrants further investigation using larger and more analytically robust designs that can account for cultural mechanisms, interethnic dynamics, and historical context. Despite these limitations, the present study provides preliminary insights that may inform future research on the role of culture and ethnicity in shaping mental health patterns within multiethnic Indonesian settings.

Conclusion

This preliminary study among residents of Makassar revealed a relatively elevated mean CES-D score and a high prevalence of depressive symptoms, ranging from mild to severe. Among the sociodemographic variables examined, ethnicity was the remained factor statistically associated with CES-D scores, with lower mean scores observed among participants of Makassar ethnicity. These findings may indicate

a potentially context-specific association between cultural identity and depressive symptomatology. However, given the exploratory design and limited sample size, further large-scale and methodologically robust studies are needed to clarify the role of ethnicity or cultural factors in depression within Indonesia's increasingly urban and multiethnic populations.

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References

1. Peltzer K, Pengpid S. High prevalence of depressive symptoms in a national sample of adults in Indonesia: Childhood adversity, sociodemographic factors and health risk behaviour. *Asian J Psychiatr*. 2018;33:52–9. <https://doi.org/10.1016/j.ajp.2018.03.017>
2. Purba FD, Fitriana TS. Sociodemographic Determinants of Self-reporting Mental Health Problems in Indonesian Urban Population. *Psychol Res Urban Soc*. 2019 Apr 30;2(1):10. <https://doi.org/10.7454/proust.v2i1.46>
3. Purborini N, Lee MB, Devi HM, Chang HJ. Associated factors of depression among young adults in Indonesia: A population-based longitudinal study. *J Formos Med Assoc*. 2021;120(7):1434–43. <https://doi.org/10.1016/j.jfma.2021.01.016>
4. Tran TD, Kaligis F, Wiguna T, Willenberg L, Nguyen HTM, Luchters S, Azzopardi P, Fisher J. Screening for depressive and anxiety disorders among adolescents in Indonesia: Formal validation of the centre for epidemiologic studies depression scale – revised and the Kessler psychological distress scale. *J Affect Disord*. 2019;246:189–94. <https://doi.org/10.1016/j.jad.2018.12.042>
5. Astutik E, Hidajah AC, Tama TD, Efendi F, Li CY. Prevalence and determinants of depressive symptoms among adults in Indonesia: A cross-sectional population-based national survey. *Nurs Forum*. 2021;56(1):37–44. <https://doi.org/10.1111/nuf.12508>
6. Ramadianto AS, Kusumadewi I, Agiananda F, Raharjanti NW. Symptoms of depression and anxiety in Indonesian medical students: association with coping strategy and resilience. *BMC Psychiatry*. 2022;22(1):92. <https://doi.org/10.1186/s12888-022-03745-1>
7. Sinaga IOY, Barliana MI, Pradipta IS, Iskandarsyah A, Abdulah R, Alfian SD. Depression is Associated with the Increase Risk of Multimorbidity Among the General Population in Indonesia. *J Multidiscip Healthc*. 2022;15:1863–70. <https://doi.org/10.2147/jmdh.s372712>
8. Handajani YS, Schröder-Butterfill E, Hogervorst E, Turana Y, Hengky A. Depression among Older Adults in Indonesia: Prevalence, Role of Chronic Conditions and Other Associated Factors. *Clin Pract Epidemiol Ment Health*. 2022;18(1):e174501792207010. <https://doi.org/10.2174/17450179-v18-e2207010>
9. Gunawan I, Huang XY. Prevalence of depression and its related factors among older adults in Indonesian nursing homes. *Belitung Nurs J*. 2022;8(3):222. <https://doi.org/10.33546/bnj.2075>
10. Idris H, Tuzzahra F. Factors associated with depressive symptoms among adolescents in Indonesia: A cross-sectional study of results from the Indonesia Family Life Survey. *Malaysian Fam Physician*. 2023;18:29. <https://doi.org/10.51866/oa.265>
11. Peltzer K, Pengpid S. Depressive symptoms and social demographic, stress and health risk behaviour among university students in 26 low-, middle- and high-income countries. *Int J Psychiatry Clin Pract*. 2015;19(4):260–6. <https://doi.org/10.3109/13651501.2015.1082598>
12. Szűcs A, van der Lubbe SCC, Arias de la Torre J, Valderas JM, Hay SI, Bisignano C, Morgan BW, Acharya S, Adnani QES, Apostol GLC, Aslam MS, Asri Y, Aung ZZ, Aurizki GE, Baig AA, Bermudez ANC, Cenderadewi M, Danpanichkul P, Efendi F, Estrada CAM, Faulk NK, Fridayani NKY, Garcia FB, Hasan F, Ibrahim UI, Ilyas MF, Ismail NE, Jamaluddin J, Jamora RDG, Jonas JB, Kanmodi KK, Khan KU, Khotimah FH, Kim YJ, Kurniasari MD, Kust-anti CY, Kusuma D, Laksono T, Lau J, Loreche AM, Ma ZF, Maravilla JC, Marzo RR, Maude RJ, Pornaveetus T, Rahmawaty S, Rodriguez A, Roy B, Salami AA, Samodra YL, Sreeramareddy CT, Subramaniyan V, Sukaew T, Sulistiyorini D, Sumpaico-Tanchanco LBC, Wicaksana AL, Wong YJ, Younis MZ, Zuniga YMH, Murray CJL, Santomauro DF, Ng M. The epidemiology and burden of ten mental disorders in countries of the Association of Southeast Asian Nations (ASEAN), 1990–2021: findings from the Global Burden of Disease Study 2021. *Lancet Public Heal*. 2025;10(6):e480–91. [https://doi.org/10.1016/S2468-2667\(25\)00098-2](https://doi.org/10.1016/S2468-2667(25)00098-2)
13. Agustin WS, Prastika HA, Kendrasti GK, Fajriyah R, Le-Quy V. Clustering the Depression Prevalence in Indonesia Provinces through Natural Breaks Jenks Method. *Clin Pract Epidemiol Ment Health*. 2025;21(1):e17450179375982. <https://doi.org/10.2174/0117450179375982250512114928>
14. Riskesdas. Basic Health Research 2018 [in Bahasa]. Jakarta; 2018 [cited: 2025 Oct 01]. Available at: <https://layanandata.kemkes.go.id/katalog-data/riskesdas/ketersediaan-data/riskesdas-2018>
15. McKenzie K. Urbanization, social capital and mental health. *Glob Soc Policy*. 2008;8(3):359–77. <https://doi.org/10.1177/1468018108095633>
16. Mumang AA. Epidemiological Transition and the Phenomenon of Depression in Indonesia: a Narrative Review. *J Clin Med Kazakhstan*. 2025;22(3):48–52. <https://doi.org/10.23950/jcmk/16449>

17. Akhtar-Danesh N, Landeen J. Relation between depression and sociodemographic factors. *Int J Ment Health Syst.* 2007;1(1):4. <https://doi.org/10.1186/1752-4458-1-4>
18. Silva M, Loureiro A, Cardoso G. Social determinants of mental health: a review of the evidence. *Eur. J. Psychiat.* 2016;30.
19. Mumang AA, Liaury K, Syamsuddin S, Maria IL, Tanra AJ, Ishida T, et al. Socio-economic-demographic determinants of depression in Indonesia: A hospital-based study. *PLoS One.* 2020;15(12):e0244108. <https://doi.org/10.1371/journal.pone.0244108>
20. Mumang AA, Syamsuddin S, Maria IL, Yusuf I. Gender Differences in Depression in the General Population of Indonesia: Confounding Effects. *Depress Res Treat.* 2021;2021:3162445. <https://doi.org/10.1155/2021/3162445>
21. Istiqlal T, Mumang AA, Liaury K, Uchida Y, Kihara M, Tanra AJ, et al. Self-construal and behavioral motivation systems among patients with depression in Indonesia: A hospital-based study. *Heliyon.* 2022;8(7):e09839. <https://doi.org/10.1016/j.heliyon.2022.e09839>
22. Radloff LS. The CES-D Scale: A Self-Report Depression Scale for Research in the General Population. *Appl Psychol Meas.* 1977;1(3):385–401. <https://doi.org/10.1177/014662167700100306>
23. Vilagut G, Forero CG, Barbaglia G, Alonso J. Screening for depression in the general population with the Center for Epidemiologic Studies Depression (CES-D): A systematic review with meta-analysis. *PLoS One.* 2016;11(5):e0155431. <https://doi.org/10.1371/journal.pone.0155431>
24. Moon JR, Huh J, Song J, Kang IS, Park SW, Chang SA, et al. The Center for Epidemiologic Studies Depression Scale is an adequate screening instrument for depression and anxiety disorder in adults with congenital heart disease. *Health Qual Life Outcomes.* 2017;15(1):176. <https://doi.org/10.1186/s12955-017-0747-0>
25. Antweiler C. Transethnic Identity and Urban Cognition in Makassar: Regionalism and the Empowering Potential of Local Knowledge. *Proc 1st Int Symp J Antropol Indones.* 2000.
26. Rahim M, Abbas I. The Development Characteristics of Makassar City in Past and Present. *Int Rev Spat Plan Sustain Dev.* 2024;12(2):238–65. https://doi.org/10.14246/irspsd.12.2_238
27. Akil A, Yudono A, Latief I, Radja AM. Application of Buginese-Makassarese culture in Makassar City, Indonesia A Reference in the Coastal City Planning. *Int Rev Spat Plan Sustain Dev.* 2014;2(4):68–80. https://doi.org/10.14246/irspsd.2.4_68
28. Arifin IA, Darmayanti DP. Intercultural Interaction in the Multiethnic Context of Makassar City: A Case Study in an Urban Neighborhood. *KnE Soc Sci.* 2024;759-68. <https://doi.org/10.18502/kss.v9i2.14897>
29. Moein A. Menggali nilai-nilai budaya Bugis-Makassar dan Sirik na pacce [in Bahasa]. Ujung Pandang: MAPRESS; 1990. 179 p.
30. Abdullah H. Siri': kearifan budaya Sulawesi Selatan : dirangkum dari makalah pakar, budaya-wan Sulawesi Selatan dan Malaysia [in Bahasa]. DKI Jakarta: Lembaga Kesenian Sulawesi Selatan DKI Jakarta bersama Badan Kesenian Indonesia DKI Jakarta; 2009. 378 p.
31. Reski P, Nur R, Widayati C. Local Wisdom of Bugis Makassar Siri 'na Pacce From Millennials Glasses. *Proc 2nd Int Conf Soc Sci Educ (ICSSE 2020).* 2021.
32. Mattulada HA. Manusia dan kebudayaan bugis - makassar dan kaili di sulawesi [in Bahasa]. 1991. 85 p.