



Depression Literacy and Its Relationship with Psychological Status among Patients with Type 2 Diabetes Mellitus at Indonesia: A Community Mental Health Perspective

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ABSTRACT

The aim of this study was to determine the relationship between depression literacy and psychological status among T2DM patients in primary health care services in Indonesia, which are still limited. This study analyzed this relationship among T2DM patients at the Kabila Community Health Center, Bone Bolango Regency, Gorontalo. A cross-sectional design was applied to 74 T2DM patients (from a population of 292; Slovin's formula, $e = 10\%$) recruited by random sampling in January 2025. Depression literacy was measured using the Depression Literacy Questionnaire (D-Lit; 18 valid items; Cronbach's $\alpha = 0.799$) and psychological status with the General Health Questionnaire (GHQ-12; Likert 0-3; $\alpha = 0.648$). Data were analyzed using Spearman correlation, Kruskal-Wallis, and the Holm-corrected Mann-Whitney test. The mean depression literacy score was 7.20 (SD = 2.63), with the majority at a moderate level (67.57%); The mean GHQ-12 score was 19.12 (SD = 4.51), with 93.24% showing mild to severe levels of stress. Depression literacy scores did not significantly correlate with stress scores ($\rho = -0.17$; 95% CI -0.38 to 0.07; $p = 0.156$), but stress levels differed across literacy categories ($\rho = 7.49$; $p = 0.024$): the low literacy group showed higher stress than the moderate literacy group (median 26.0 vs. 18.0; Holm $p = 0.021$). More severe stress levels alleviated patients with the lowest levels of depression literacy, thus supporting community-based stress screening and targeted depression literacy education as social interventions in primary care.

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INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a non-communicable disease whose burden has become as much a social as a clinical problem in Indonesia. The International Diabetes Federation estimated the adult diabetes prevalence in Indonesia at 10.8% in 2021, placing the country among the ten nations with the highest number of people with diabetes and the steepest increase worldwide [1]. National projections indicate this prevalence may rise from 9.19% in 2020 to 16.09% by 2045 unless risk-factor control and community-based non-communicable disease programs are strengthened [2]. Because the disease is chronic, lifelong, and demanding of daily self-management, its consequences extend beyond blood glucose into the psychological and social lives of patients and their families, making it a legitimate object of study for the social and community health sciences rather than clinical medicine alone.

Psychological comorbidity in T2DM is not merely a quality-of-life concern; it shapes clinical outcomes and, through them, the social and economic participation of affected households. People with diabetes carry a substantially higher risk of depression than those without diabetes [3,4], and depression and distress in T2DM patients are associated with poorer

medication adherence, lower glycemic control, and increased risk of vascular complications [5,6]. Cohort evidence shows that diabetes complications and affective disorders reinforce one another bidirectionally [7], while in South and Southeast Asia the prevalence of depression among T2DM patients is high, for example 42% in a Bangladeshi meta-analysis [4] and a substantial proportion among patients in Nepal [8,9]. Closer to the present context, a cross-country study of 606 T2DM patients in Indonesia and Malaysia reported that 56.5% were at risk of depression and 41.6% at risk of anxiety [10], whereas diabetes-specific distress frequently exceeds depression and anxiety in primary care settings [11], and this psychological burden increased during the COVID-19 pandemic [12]. In response, diabetes care standards recommend screening for psychosocial concerns including diabetes distress, depression, and anxiety—at least annually using validated tools [13,14,15]. Yet screening presupposes a population able to recognize its own distress, which is unevenly distributed across social groups.

The uneven distribution of the capacity to recognize and act on mental distress is a social determinant of mental health in its own right. Interventions that target the social determinants of mental disorders education, income, social support, and access to knowledge are increasingly recognized as effective levers for reducing the population burden of mental illness and for advancing the Sustainable Development Goals [16]. Within this framework, the individual-level capability at stake is mental health literacy: the knowledge and beliefs about mental disorders that aid their recognition, management, and prevention [17]. In the specific case of depression, this capability is operationalized as depression literacy through instruments such as the Depression Literacy Questionnaire [18]. Mental health literacy is not merely private knowledge; it is a socially produced resource, shaped by education, gender, and community context, and it functions as a gateway to help-seeking and early intervention [19].

Low depression literacy carries social consequences that compound the clinical burden of diabetes. It contributes to delayed help-seeking, stigma, and weak intentions to seek professional help [20,21], and among general and student populations, adequate mental health literacy relates to better help-seeking intentions and milder psychological symptoms [22,23]. Among patients with chronic disease, low health literacy is associated with more severe depressive symptoms [24]. For people with T2DM, the problem is compounded because the somatic symptoms of depression fatigue, sleep disturbance, and appetite change overlap with those of diabetes and are easily attributed to the physical illness alone, so distress remains unnamed and untreated within families and communities that lack a shared vocabulary for mental health.

Despite this social significance, the direction and strength of the relationship between depression literacy and psychological status remain inconsistent, particularly in T2DM populations. A study of 400 T2DM patients in Iran found a weak but significant negative correlation between depression literacy and depression ($r = -0.192$), anxiety ($r = -0.238$), and stress ($r = -0.156$), and concluded that both mental health literacy and depression literacy in T2DM patients were inadequate [25]. However, the small correlation magnitude in that adequately powered study suggests the relationship may not be simply linear, and evidence from primary-care and community settings in middle-income countries including Indonesia remains scarce. Prior evidence has also relied on the general population, students, or non-Indonesian settings [26,27], limiting its usefulness for community health nurses working with older, low-education T2DM patients at the primary-care level, where the social gradient in literacy is likely to be steepest.

Based on this gap, the present study aimed to analyze the relationship between depression literacy and psychological status among T2DM patients at Kabila Public Health Center, Bone Bolango Regency, Gorontalo, and to interpret that relationship through a community mental health lens. The findings are intended to inform community health nurses, cadres, and local health policy in designing socially targeted mental health education integrated with non-communicable disease management in primary care, thereby contributing to the broader agenda of addressing the social determinants of mental health in a middle-income setting.

RESEARCH METHODS

Study design. This was a quantitative cross-sectional study, **Population, sample, and setting.** The study was conducted in the catchment area of Kabila Public Health Center, Bone Bolango Regency, Gorontalo Province, in January 2025. The population comprised all 292 T2DM patients registered at the center. The sample size was determined using the Slovin formula (10% margin of error), yielding 74 respondents recruited through accidental sampling. The inclusion criterion was willingness to participate; the exclusion criterion was hearing impairment. As a post hoc sensitivity analysis, with $n = 74$, $\alpha = 0.05$, and power = 0.80, the study could detect a minimum correlation of rho of approximately 0.32. **Instruments.** Depression literacy was measured using the Depression Literacy Questionnaire (D-Lit) [18]. Validity and reliability testing was performed on 30 T2DM patients at Tapa Public Health Center from November 2024; of the items tested the thesis reports 21 items tested, whereas the original D-Lit contains 22 items clarify 18 valid items were retained (item-total $r = 0.390$ - 0.635 > table $r = 0.374$; 3 items dropped) with Cronbach's $\alpha = 0.799$. The final instrument comprised 18 dichotomous statements (favorable and unfavorable, with reverse scoring for unfavorable items; correct answer = 1; total range 0-18) spanning five domains: psychological symptoms (6 items), effectiveness of treatment methods (2 items), cognitive-behavioral symptoms (6 items), medication and its side effects (3 items), and disease severity (1 item). Scores were categorized by mean $\pm$ 1 SD of the sample distribution into low ($< M - 1SD$; score ≤ 4), moderate (score 5-9), and high ($> M + 1SD$; score ≥ 10). Psychological status was measured using the General Health Questionnaire (GHQ-12), Indonesian version [28]. The instrument comprises 12 statements on a four-point Likert scale (0-3) based on symptom frequency over the past week; favorable items were reverse-scored (Never = 3, Always = 0) and unfavorable items scored directly (Never = 0, Always = 3), yielding a total of 0-36 with higher scores indicating greater distress. Pilot testing showed all items valid (item-total $r = 0.390$ - 0.587 > 0.374) with Cronbach's $\alpha = 0.648$. Total scores were categorized as without distress (0-12), mild distress (13-24), and severe distress (25-36) [29].

Data collection. Primary data were collected directly from respondents by questionnaire after tiered permissions were obtained from the educational institution, the Gorontalo Provincial Health Office, the Bone Bolango investment and one-stop-service office, the Bone Bolango District Health Office, and Kabila Public Health Center. Secondary data (number of T2DM patients) were obtained from the center. Z-Score < 1.81 is categorized as a company with enormous financial difficulties and at risk of bankruptcy.

Data analysis. All total scores were recomputed from item-level data to ensure accuracy before analysis. Respondent characteristics were presented as frequencies and percentages; numeric variables as mean (SD) and median. Normality was tested with Shapiro-Wilk. Because both main variables were non-normal, the relationship between depression-literacy and psychological-status scores was tested with Spearman correlation (with 95% CI) as the primary analysis, supported by Kruskal-Wallis across literacy categories with epsilon-squared effect size and Holm-corrected Mann-Whitney post hoc tests. Analyses used Python 3 (SciPy, pandas); significance was set at 0.05 (two-tailed).

RESULTS AND DISCUSSION

Respondent characteristics.

Seventy-four T2DM patients participated. Ages ranged from 36 to 79 years (mean 61.57, SD 9.54); most were women (89.19%), had primary-school education (45.95%), were married (60.81%), unemployed (77.03%), and lived with family (91.89%). More than half (55.41%) had at least one comorbidity, most commonly hypertension (Table 1). This profile predominantly older women with low formal education and outside the paid workforce describes a socially vulnerable group in which the social determinants of both diabetes and mental distress converge, and it frames the interpretation of the literacy findings that follow.

Table 1. Respondent characteristics (N = 74)

Characteristic	n	%
Sex: Female	66	89.19
Sex: Male	8	10.81
Education: Primary	34	45.95
Education: Junior secondary	15	20.27
Education: Senior secondary	20	27.03
Education: Higher	5	6.76
Marital status: Married	45	60.81
Marital status: Widowed	29	39.19
Employment: Not working	57	77.03
Employment: Working	17	22.97
Living with family	68	91.89
Living alone	6	8.11
Comorbidity ≥ 1	41	55.41
Age, mean (SD); range	61.57 (9.54); 36-79	—

Depression literacy and psychological status.

Mean depression literacy was 7.20 (SD 2.63; median 7; range 2-14 of 18), with a non-normal distribution ($W = 0.936$; $p = 0.001$). By the mean ± 1 SD categorization, 10.81% were low, 67.57% moderate, and 21.62% high. The domain with the lowest proportion of correct answers was medication and its side effects (27.03%), and the highest was effectiveness of treatment methods (45.27%). Mean GHQ-12 was 19.12 (SD 4.51; median 18; range 9-27 of 36), also non-normal ($W = 0.916$; $p < 0.001$). Most respondents had mild distress (68.92%), 24.32% severe distress, and only 6.76% without distress; overall, 93.24% experienced mild-to-severe distress (Table 2).

Table 2. Descriptive statistics of main variables (N = 74)

Variable	Mean (SD)	Median	Min-Max	Category, n (%)
Depression literacy (0-18)	7.20 (2.63)	7.0	2-14	Low 8 (10.81); Moderate 50 (67.57); High 16 (21.62)
Psychological status/GHQ-12 (0-36)	19.12 (4.51)	18.0	9-27	Without 5 (6.76); Mild 51 (68.92); Severe 18 (24.32)

Relationship between depression literacy and psychological status.

In the primary analysis, depression-literacy score showed a weak, non-significant negative correlation with distress score ($\rho = -0.17$; 95% CI -0.38 to 0.07; $p = 0.156$). However, distress differed significantly across literacy categories (Kruskal-Wallis $H = 7.49$; $p = 0.024$; epsilon-squared = 0.08). Holm-corrected Mann-Whitney post hoc tests showed higher distress in the low-literacy group than the moderate group (median 26.0 [IQR 18.8-26.0] vs 18.0 [IQR 16.2-19.0]; Holm- $p = 0.021$; $r = 0.36$) and a tendency toward higher distress than the high group (Holm- $p = 0.051$; $r = 0.46$), whereas the moderate and high groups did not differ (Holm- $p = 0.928$; $r = -0.01$). More severe distress was thus concentrated in the lowest-literacy subgroup, without a further gradient at higher literacy levels (Table 3).

Table 3. Relationship between depression literacy and psychological status (N = 74)

Test	Statistic	95% CI	p	Effect size
Spearman correlation (score-score)	rho = -0.167	-0.382 to 0.066	0.156	rho (weak)
Kruskal-Wallis (across categories)	H = 7.49	—	0.024	epsilon-squared = 0.08
Post hoc: low vs moderate	U = 319.5	—	0.021*	r = 0.36
Post hoc: low vs high	U = 100.5	—	0.051*	r = 0.46
Post hoc: moderate vs high	U = 393.5	—	0.928*	r = -0.01

DISCUSSION

The main finding is tiered rather than linear. Depression-literacy score was not monotonically correlated with distress score ($\rho = -0.17$; $p = 0.156$), yet patients in the lowest literacy category showed significantly greater distress than the moderate category, with a moderate effect size ($r = 0.36$). This pattern is better read as a threshold effect than a dose-response gradient: falling below a minimum level of literacy appears associated with a much higher psychological burden, whereas gains in literacy above that threshold are no longer accompanied by lower distress. The interpretation is consistent with a correlation confidence interval that leans negative yet crosses zero, and with the absence of any difference between the moderate and high groups. For a community health audience, the practical meaning is that the benefit of literacy is concentrated among the least literate, which is precisely the group least likely to be reached by conventional, individually initiated care.

The negative direction aligns with prior evidence, although the present study refines its shape. The study of 400 T2DM patients in Iran found depression literacy weakly but significantly negatively correlated with depression ($r = -0.192$), anxiety, and stress [25]; the small magnitude in that well-powered study is consistent with the idea that the literacy-distress relationship is not simply linear and may be concentrated in the lowest-literacy range. The tiered finding here offers a plausible reconciliation of inconsistent evidence: the association tends to be detectable only in the lowest-literacy subgroup, so studies dominated by mid-to-high literacy or that test only linear correlation may report small or null associations. Framing the result this way turns an apparently null primary correlation into a socially meaningful signal about where need is concentrated.

Several mechanisms, spanning the individual and the social, may explain the threshold effect. Within the mental health literacy framework, a minimum level of knowledge is needed for individuals to label their emotional experience, perceive the benefit of help-seeking, and translate it into help-seeking behavior; without this labeling capacity, distress goes unrecognized and accumulates within families and communities [17,22]. Above that threshold, distress in T2DM patients is likely driven more by the disease burden itself treatment regimens, dietary restrictions, and fear of complications—relatively independent of knowledge about depression [5,7]. The distinct role of diabetes-specific distress apart from glycemic control and self-care has also been documented in primary care [30]. An alternative explanation that cannot be excluded in a cross-sectional design is reverse causation: severe distress may reduce the cognitive capacity to absorb mental health information, so low literacy is a consequence rather than a cause [24]. The bidirectional relationship between affective disorders and diabetes is well documented clinically [6]. Because these mechanisms operate through knowledge, stigma, and social support each socially patterned he threshold effect is best understood as a manifestation of the social determinants of mental health rather than a purely psychological phenomenon [16].

Two descriptive findings carry importance for community mental health practice. Mean depression literacy was only 7.20 of 18 (about 40% correct), with the medication-and-side-effects domain the lowest consistent with reports that both mental health literacy and depression literacy among T2DM patients are inadequate [25] and that low depression literacy relates to poor help-seeking attitudes [20,21]. Meanwhile, 93.24% of respondents experienced mild-to-severe distress and nearly a quarter severe distress proportions consistent with the high depression burden among T2DM patients in Asia [4,8,9]. This combination signals a large unmet need: most patients carry psychological distress but likely lack a shared framework to interpret it as a treatable health problem, a gap that individual clinical encounters alone are poorly positioned to close.

The social patterning of the sample sharpens these implications. The respondents were overwhelmingly older women with primary education and outside the paid workforce characteristics that international evidence links both to higher psychological distress and to lower mental health literacy, and that mark a group at the intersection of several social determinants of mental ill-health [16,24]. In such a group, expecting individuals to independently recognize depression and seek professional help is unrealistic; the more equitable route is to build recognition capacity at the community level. This reframes depression literacy from a private attribute into a collective resource that health systems can deliberately cultivate.

For community health nursing and local health policy, the implications are concrete and consistent with current directions. Diabetes care standards recommend screening for distress and depression at least annually with validated tools [13,14,15]; this study adds that community programs should actively identify the lowest-literacy subgroup and deliver depression-literacy education targeting the weakest domain, medication and its side effects. Such targeting is justified because health-literacy interventions in patients with chronic disease have improved outcomes in a meta-analysis of randomized controlled trials [31], and because interventions addressing the social determinants of mental health are among the most promising population-level levers available [16]. In Indonesia, this integration can be pursued through the Integrated Development Post for Non-Communicable Diseases (Posbindu PTM) and the Chronic Disease Management Program (Prolanis), which empower trained community cadres to reach at-risk residents without relying on individual initiative, although sustainability and coverage still face documented challenges [32]. Embedding brief distress screening and cadre-delivered depression-literacy education into these existing community platforms would operationalize the study's findings within structures that already exist in the primary-care system.

The gendered and educational composition of the sample deserves explicit attention because it locates the burden within recognizable social strata. Nearly nine in ten respondents were women, and almost half had only primary education, mirroring the wider Indonesian pattern in which older women bear a disproportionate share of both chronic disease and unrecognized psychological distress. Education shapes depression literacy directly, by conditioning exposure to health information and the vocabulary needed to name emotional experience, and indirectly, by shaping confidence to seek help outside the household; gender further modulates this through caregiving roles and the social acceptability of disclosing distress. Interpreting the low-literacy subgroup as a social category rather than a random cluster implies that interventions must be designed for, and delivered to, women with limited formal schooling, using plain-language and orally mediated formats rather than text-dependent materials. This is a task for which community health nurses and lay cadres embedded in local social networks are better positioned than clinic-based, appointment-driven services, and it reframes the nurse's role from individual educator to community mobilizer addressing an upstream social determinant [16,24].

The scalability of such an approach is central to its policy relevance in a middle-income setting with constrained specialist capacity. Because depression-literacy education targeting a single weak domain is low-cost, standardizable, and deliverable by non-specialist cadres, it is well suited to the task-shifting logic that underpins Indonesia's community health system, and health-literacy interventions delivered in this mode have improved outcomes among chronic-disease patients elsewhere [31]. Digital adjuncts short audio-visual modules, reminder messaging, or cadre-facing job aids could extend reach and consistency without displacing the trusted, face-to-face relationships on which community delivery depends, although their effectiveness for mental health literacy in low-resource, low-literacy populations still requires local evaluation. Positioned this way, the present findings contribute not only a clinical observation about T2DM patients but a socially grounded argument for investing community infrastructure in mental health literacy as a modifiable determinant of population mental health.

This study has limitations that temper its conclusions. The cross-sectional design precludes causal or temporal inference, and accidental sampling from a single health center dominated by older women limits generalizability. The low-literacy subgroup was small ($n = 8$), so the post hoc results warrant caution and require replication. The sample-based (mean ± 1 SD) literacy categorization lacks external validation, and GHQ-12 reliability at pilot testing was moderate ($\alpha = 0.648$), which may attenuate measurement precision. Both instruments are self-reported and thus prone to social-desirability bias. Future research should use longitudinal, multi-site designs with oversampling of low-literacy patients, incorporate mediators such as help-seeking behavior, social support, and diabetes distress, and evaluate community-delivered depression-literacy interventions—ideally cadre-led—on psychological outcomes, so that the social mechanisms proposed here can be tested rather than inferred.

CONCLUSION

More severe psychological distress among T2DM patients was concentrated in the subgroup with the lowest depression literacy, without a linear gradient at higher literacy levels, amid a high distress burden (93.24% mild-to-severe) and limited, socially patterned literacy in most respondents. Interpreted through a community mental health lens, the finding identifies the least-literate, most socially vulnerable patients as the priority group for intervention. It supports integrating community-based distress screening and targeted depression-literacy education delivered through existing primary-care and community platforms into non-communicable disease management, as a practical way of addressing a social determinant of mental health in a middle-income setting.

SUGGESTION

Community health nurses, cadres, and primary-care managers should incorporate brief, validated distress screening into routine T2DM services and prioritize depression-literacy education for patients identified as having the lowest literacy, focusing on the weakest domain (medication and its side effects), delivered through Posbindu PTM and Prolanis by trained community cadres. Local health authorities should consider embedding these activities in existing community structures rather than creating parallel services, to improve reach among older, low-education, and unemployed residents. Longitudinal, multi-site studies with a larger low-literacy subgroup are needed to confirm the observed threshold effect and to test whether raising depression literacy at the community level reduces psychological distress.

REFERENCES

1. Sun H, Saeedi P, Karuranga S, Pinkepank M, Ogurtsova K, Duncan BB, et al. IDF Diabetes Atlas: Global, regional and country-level diabetes prevalence estimates for 2021 and projections for 2045. *Diabetes Res Clin Pract.* 2022;183:109119.
2. Wahidin M. Projection of diabetes morbidity and mortality till 2045 in Indonesia based on risk factors and NCD prevention and control programs. [BUTUH KONFIRMASI: journal, volume, pages] 2024.
3. Ali S, Stone MA, Peters JL, Davies MJ, Khunti K. The prevalence of co-morbid depression in adults with type 2 diabetes: a systematic review and meta-analysis. *Diabet Med.* 2006;23(11):1165-73.
4. Al-Mamun F, Hasan M, Quadros S, Kaggwa MM, Mubarak M, Sikder MT, et al. Depression among Bangladeshi diabetic patients: a cross-sectional, systematic review, and meta-analysis study. *BMC Psychiatry.* 2023;23:369.
5. Nouwen A, Adriaanse MC, van Dam K, Iversen MM, Viechtbauer W, Peyrot M, et al. Longitudinal associations between depression and diabetes complications: a systematic review and meta-analysis. *Diabet Med.* 2019;36(12):1562-72.
6. Li G, Yu Y, Lin C, Zheng S, Tu H, Xu W. Association between major depressive disorder or depressive symptoms and the risk of vascular complications among patients with type 2 diabetes: an analysis of the UK Biobank cohort. *eClinicalMedicine.* 2025;79:102982.
7. Enevoldsen FC, [BUTUH KONFIRMASI: full author list]. Diabetic complications and risk of depression and anxiety among adults with type 2 diabetes. *Diabet Med.* 2024;41:e15272.

8. Sharma K, Dhungana G, Adhikari S, Pandey AB, Sharma M. Depression and anxiety among patients with type II diabetes mellitus in Chitwan Medical College Teaching Hospital, Nepal. *Nurs Res Pract*. 2021;2021:8846915.
 9. Karki A, Vandelanotte C, Rawal LB. Depressive symptoms, perceived stress, and associated socio-demographic and diabetes-related factors in people with type 2 diabetes in Nepal. *Asia Pac J Public Health*. 2024;36(7):719-29.
 10. Elnaem MH, Bukhori NAS, Tengku Mohd Kamil TK, Rahayu S, Ramatillah DL, Elrggal ME. Depression and anxiety in patients with type 2 diabetes in Indonesia and Malaysia: do age, diabetes duration, foot ulcers, and prescribed medication play a role? *Psychol Health Med*. 2025;30(3):555-71.
 11. Sayed Ahmed HA, Fouad AM, Elotla SF, Joudeh AI, Mostafa M, Shah A, et al. Prevalence and associated factors of diabetes distress, depression and anxiety among primary care patients with type 2 diabetes during the COVID-19 pandemic in Egypt. *Front Psychiatry*. 2022;13:937973.
 12. Busili A, Kumar K, Kudrna L, Rabbani U. Examining the impact of the COVID-19 pandemic on mental health among adults with type 2 diabetes: a systematic review. *Medicine (Baltimore)*. 2025;104:e43112.
 13. American Diabetes Association Professional Practice Committee. Summary of revisions: Standards of Care in Diabetes-2025. *Diabetes Care*. 2025;48(Suppl 1):S6-13.
 14. American Diabetes Association Professional Practice Committee. Summary of revisions: Standards of Care in Diabetes-2026. *Diabetes Care*. 2026;49(Suppl 1):S6.
 15. Perkumpulan Endokrinologi Indonesia (PERKENI). Pedoman pengelolaan dan pencegahan diabetes melitus tipe 2 dewasa di Indonesia 2021. Jakarta: PB PERKENI; 2021.
 16. Oswald TK, Nguyen MT, Mirza L, Lund C, Jones HG, Crowley G, et al. Interventions targeting social determinants of mental disorders and the Sustainable Development Goals: a systematic review of reviews. *Eur Psychiatry*. 2024;67(1). doi:10.1192/j.eurpsy.2024.591
 17. Jorm AF. Mental health literacy: public knowledge and beliefs about mental disorders. *Br J Psychiatry*. 2000;177(5):396-401.
 18. Griffiths KM, Christensen H, Jorm AF, Evans K, Groves C. Effect of web-based depression literacy and cognitive-behavioural therapy interventions on stigmatising attitudes to depression: randomised controlled trial. *Br J Psychiatry*. 2004;185(4):342-9.
 19. Wei Y, McGrath PJ, Hayden J, Kutcher S. Measurement properties of mental health literacy tools measuring help-seeking: a systematic review. *J Ment Health*. 2017;26(6):543-55.
 20. Lee YJ. Depression literacy, associated factors, and correlation of related variables in middle-aged Korean adults: a cross-sectional study. *Int J Environ Res Public Health*. 2023;20(11):6021.
 21. Al-Shannaq Y, Jaradat D, Ta'an WF, Jaradat D. Depression stigma, depression literacy, and psychological help-seeking attitudes among school and university students. *Arch Psychiatr Nurs*. 2023;46:98-106.
 22. Zeng F, John WCM, Qiao D, Sun X. Association between psychological distress and mental help-seeking intentions in international students of the National University of Singapore: a mediation analysis of mental health literacy. *BMC Public Health*. 2023;23:2358.
 23. Yao ZY, Wang T, Yu YK, Li R, Sang X, Fu YN, et al. Mental health literacy and suicidal ideation among Chinese college students: the mediating role of depressive and anxiety symptoms. *J Affect Disord*. 2023;339:293-301.
 24. Kim E. Exploring the relationship between health literacy and depression among individuals with chronic conditions: insights from the KCHS. *Healthcare (Basel)*. 2024;12(19):1927.
 25. Jafari A, Moshki M, Naddafi F, Ghelichi-Ghojogh M, Armanmehr V, Kazemi K, et al. Depression literacy, mental health literacy, and their relationship with psychological status and quality of life in patients with type 2 diabetes mellitus. *Front Public Health*. 2024;12:1421053.
 26. Tehrani H, Vali M, Nejatian M, Moshki M, Charoghchian Khorasani E, Jafari A. The status of depression literacy and its relationship with quality of life among the Iranian public: a cross-sectional study. *BMC Psychiatry*. 2022;22:469.
 27. Tehrani H, Nejatian M, Moshki M, Jafari A. Psychometric properties of the Persian version of the depression literacy (D-Lit) questionnaire among the general population. *Int J Ment Health Syst*. 2022;16:39.
 28. Idaiani S, Suhardi. [BUTUH KONFIRMASI: title, journal, volume—Indonesian GHQ-12 validation source; verify year 2006 vs 2019]. 2019.
 29. Abbas, Q., Latif, S., Ayaz Habib, H., Shahzad, S., Sarwar, U., Shahzadi, M., Ramzan, Z., & Washdev, W. (2023). Cognitive behavior therapy for diabetes distress, depression, health anxiety, quality of life and treatment adherence among patients with type-II diabetes mellitus: a randomized control trial. *BMC Psychiatry*, 23(1). <https://doi.org/10.1186/s12888-023-04546-w>
 30. Kintzoglakis K, Gkousiou A, Vonta P, Sagmatopoulos A, Copanitsanou P. Depression, anxiety, and diabetes-related distress in type 2 diabetes in primary care in Greece: different roles for glycemic control and self-care. *SAGE Open Med*. 2022;10:20503121221096605.
 31. Shao Y, Hu H, Liang Y, Hong Y, Yu Y, Liu C, et al. Health literacy interventions among patients with chronic diseases: a meta-analysis of randomized controlled trials. *Patient Educ Couns*. 2023;114:107829.
 32. Krisnadewi et al. Implementation of the preventive program for diabetes mellitus (PROLANIS) at a community health center in Indonesia: a qualitative study. 2024.
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