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# Diabetes Distress, Burnout, and Self-Efficacy in Relation to Self-Care Among Adults with Type 2 Diabetes in Banda Aceh, Indonesia

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## Abstract

**Background:** Self-management in type 2 diabetes mellitus (T2DM) requires sustained daily behavior. Distress, burnout, and self-efficacy may be related to these practices, but their conceptual overlap and local measurement validity warrant examination.
**Objective:** To assess the separate cross-sectional associations of diabetes distress, diabetes burnout, and self-efficacy with self-reported diabetes self-care among outpatients in Banda Aceh, Indonesia.
**Methods:** A cross-sectional study enrolled 86 adults with T2DM at Meuraxa Hospital using purposive sampling. Self-reported self-care, distress, burnout, and confidence were assessed using reported adaptations of the SDSCA, DDS-17, 12-item DBS, and 14-item DMSES-I. Descriptive analyses and three separate unadjusted linear regressions were available. No joint adjusted regression was reported.
**Results:** Higher distress (B = −0.395; 95% CI −0.476 to −0.314; $p < 0.001$) and burnout (B = −0.361; 95% CI −0.458 to −0.264; $p < 0.001$) were associated with lower self-care scores. Higher self-efficacy was associated with higher scores (B = 0.302; 95% CI 0.025 to 0.579; p = 0.033). Model $R^2$ values were 0.530, 0.394, and 0.053, respectively.
**Conclusion:** Distress and burnout were inversely associated with self-care, while self-efficacy showed a positive association in separate unadjusted regressions. The findings support comprehensive psychosocial nursing assessment but do not establish independent predictor effects or causality.

**Keywords**: Diabetes burnout; Diabetes distress; Self-care; Self-efficacy; Type 2 diabetes mellitus.

## INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a long-term condition whose outcomes depend not only on pharmacological treatment but also on patients' ability to carry out demanding everyday care activities (1). The International Diabetes Federation identifies diabetes as a major and growing global health challenge, including in Indonesia (2). National clinical guidance similarly treats structured education, individualized self-management, and ongoing support as integral components of T2DM care (3). For patients, however, the work of diabetes management continues outside the consultation room: they must make repeated decisions about eating, activity, medication, monitoring, and responses to changing symptoms (4). These

decisions occur within financial, occupational, family, and healthcare constraints (1). Consequently, describing self-care only as a matter of individual motivation risks overlooking the emotional and contextual demands of sustaining recommended behavior over time (5).

Diabetes self-care is multidimensional, typically encompassing dietary practices, physical activity, medication-taking, blood-glucose monitoring, and foot care; the relative difficulty of these behaviors may vary by treatment regimen and access to supplies (3,6). A person may take prescribed medication consistently yet struggle with meal planning or monitoring, so an overall adherence classification can obscure clinically meaningful differences across domains (4). Furthermore, self-reported frequency measures capture recalled behavior, not necessarily the technical quality of that behavior or its effect on glycemic control (4). Evidence from different healthcare systems indicates that self-care is associated with interacting personal, social, and disease-related circumstances rather than a single universal determinant (1,6,7). This complexity calls for consideration of psychosocial constructs alongside practical barriers when describing patients' self-management experiences (4).

Two potentially relevant but conceptually distinct sources of psychological burden are diabetes distress and diabetes burnout (5). Diabetes distress refers to emotional strain arising specifically from living with and treating diabetes, including worry about complications, frustration with self-management, and difficulties negotiating diabetes-related relationships or clinical care (8,9). Burnout places greater emphasis on sustained exhaustion, detachment, and diminished engagement with diabetes-management tasks; recent research has considered its links to self-care and quality of life (7,10). The constructs may coexist, but their conceptual overlap does not justify using them interchangeably (5). A patient can be highly worried and remain behaviorally engaged, whereas another may withdraw from self-care after prolonged treatment fatigue. This distinction has implications for nursing assessment because the type of emotional difficulty may shape the support a patient needs, even when the measured scales are correlated (11).

Self-efficacy adds a different dimension to this framework (1). Rather than representing psychological burden, diabetes-management self-efficacy concerns perceived confidence in performing recommended behaviors under challenging circumstances (12). Confidence may support planning, persistence, and problem-solving when a routine becomes difficult; conversely, repeated experiences of unsuccessful management may weaken confidence (4). Contemporary work informed by Orem's self-care theory has examined relationships among perceived capacity, self-care requirements, and diabetes management (13). Nevertheless, self-efficacy is not equivalent to actual capability, availability of resources, or demonstrated adherence (4). Nor can a cross-sectional association establish whether confidence facilitates better self-care, successful self-care strengthens confidence, or both are influenced by social support and disease experience.

An integrated conceptual account suggests several plausible pathways linking these variables without assuming that any pathway has been proven. Diabetes-related stress may compete for attention and psychological energy required for daily tasks; persistent treatment fatigue may reduce willingness to initiate or maintain routines; and perceived competence may influence responses to setbacks (5). Equally, difficulties completing routines could generate distress and exhaustion, while favorable clinical encounters could increase confidence (5). These reciprocal possibilities are consistent with research that treats diabetes-related psychological, behavioral, and social factors as a connected system (7). They also explain why separate associations should not automatically be interpreted as independent mechanisms: distress, burnout, and self-efficacy may share variance, overlap with depressive symptoms, or be associated with treatment complexity, diabetes duration, and available support (1).

The empirical literature provides a basis for studying these constructs together, while also showing why the remaining uncertainty requires careful definition (14). In a T2DM path-analysis study, Jafari and colleagues examined diabetes literacy, distress, burnout, social support, complications, self-care, and quality of life within a multiconstruct framework (7). Other research has specifically linked diabetes

distress with self-care activities (8,15), while studies of perceived self-efficacy have emphasized its relevance to diabetes self-management and supportive nursing care (13,16). Thus, it would be inaccurate to claim that the distress–burnout–self-care relationship has never been studied. What remains uncertain is the reproducibility, relative magnitude, and measurement comparability of these relationships in particular Indonesian clinical contexts, especially when instruments and care circumstances differ (5). A further distinction is necessary between documenting several constructs in one sample and statistically evaluating their independent associations in an adequately specified joint model (14).

Against this background, the present hospital-based study aimed to describe the levels of diabetes distress, burnout, self-efficacy, and self-reported self-care among adults with T2DM in Banda Aceh and to estimate the direction and magnitude of each construct's unadjusted association with the self-care score. The contribution is a clinically contextualized, concurrent profile of three complementary psychosocial domains, potentially informing more nuanced nursing assessment (11). The study does not purport to discover previously unrecognized constructs or to test a causal mechanism. Because the available analyses consist of separate simple linear regressions, its findings must be interpreted as preliminary associations; independent predictor contributions, mediation, and moderation remain questions for future adequately powered multivariable or longitudinal research.

## METHODS

### Study Design

An observational, cross-sectional correlational design was used. The outcome was the recorded diabetes self-care score. Diabetes distress, diabetes burnout, and diabetes-management self-efficacy were examined individually as explanatory scores. Measurements were collected within the same period, preventing determination of temporal order. No intervention was administered.

### Setting and Participants

The sampling frame consisted of 591 T2DM outpatients at the Meuraxa Hospital internal medicine clinic in Banda Aceh. Using a Slovin-formula procedure with a stated 10% margin, the investigators targeted and purposively recruited 86 patients. Reported inclusion criteria were T2DM diagnosis, outpatient attendance, ability to read and communicate, and willingness to provide informed consent. Patients who did not consent or were unavailable during data collection were not enrolled. The record does not document additional clinical exclusion criteria, random selection, or the number screened and declining participation.

Sample-size sensitivity. No prospective G*Power calculation or anticipated regression effect size was supplied. For transparency, an exact noncentral-F sensitivity calculation equivalent to a one-predictor, two-sided $\alpha = 0.05$ linear-regression test indicates that $n = 86$ has approximately 80% power to detect $f^2 \approx 0.093$ ($R^2 \approx 0.085$) in a single-predictor model. This retrospective benchmark does not establish adequate power for a multivariable model and must not be represented as the original sample-size justification.

### Variables and Measurements

Interview-administered instruments included the Summary of Diabetes Self-Care Activities (SDSCA), developed and revised by Toobert et al. (17); the 17-item Diabetes Distress Scale (DDS-17), developed by Polonsky et al. (9); the 12-item Diabetes Burnout Scale (DBS), developed by Abdoli et al. (10); and the Indonesian Diabetes Management Self-Efficacy Scale (DMSES-I) evaluated by Marlina et al. (18). The original SDSCA asks about the frequency (0–7 days in the previous week) of domain-specific self-care practices; the source manuscript refers to a 17-item adaptation, but does not document how these items were adapted or aggregated. DDS-17 covers emotional burden, physician-related, regimen-related, and interpersonal distress; responses generally use six ordered categories and mean item scores. DBS assesses exhaustion, detachment, and loss of control on a five-category response format; its original 2021 development involved adults with type 1 diabetes. The Indonesian DMSES-I validation retained 14 items organized into three factors. The source dataset does not document the actual response anchors, item reversals, handling of missing items, or score cutoffs used for categories; an unverified score range must not be imposed.

Measurement interpretation. For the revised SDSCA, behavioral domains are usually summarized separately rather than forcing all reported items into a single adherence label; a higher score denotes more frequent behavior for the corresponding domain, with some items requiring careful scoring. DDS-17 mean values near 2 and 3 are commonly used to discuss moderate and high distress in the originating framework, but the manuscript's categories must be checked against its actual item coding. DBS item responses can be summarized as means or totals when clearly specified, and DMSES-I responses require the exact Indonesian scoring key. Reliability estimates are population- and version-specific: reporting original psychometrics cannot substitute for Cronbach α or omega calculated from the present dataset (9,10,17,18).

### Data Collection Procedures

Following ethical approval, potentially eligible clinic patients were approached, informed of the study aims, and asked for written consent. Trained-interviewer status was not specified; investigators administered the questionnaires and checked completed forms.

### Data Analysis

Frequencies and percentages described demographic features and source-defined instrument categories. The available inferential analyses were three separate ordinary least-squares regressions, one for each psychological score, with the reported self-care score as dependent variable. Unstandardized B coefficients, 95% confidence intervals, two-sided p values, and $R^2$ are reported. These are unadjusted associations; no multiple-predictor model, age- or sex-adjusted estimate, interaction, residual diagnostic, multicollinearity check, missing-data analysis, or estimate of independent effects was supplied. A robust future analysis would prespecify a clinically informed joint model, assess model assumptions and variance inflation, and examine age, sex, diabetes duration, treatment regimen, educational attainment, and other supported confounders without exceeding the available degrees of freedom.

### Ethical Considerations

This study was conducted in accordance with ethical principles for research involving human subjects. Prior to data collection, the researcher obtained ethical approval (reference number 070/101/Etik-Penelitian/VI/2026) from Meuraxa Regional General Hospital (RSUD) in Banda Aceh and provided an explanation regarding the study's objectives and procedures. Respondents willing to participate signed an informed consent form, with the assurance that their identities and information would remain confidential. Participation was voluntary, and respondents retained the right to decline or withdraw from the study without facing any consequences.

## RESULTS

Of 86 respondents, 57 were women (66.3%). The most represented age band was 56–65 years (31.4%), and 59 participants (68.6%) had secondary education. Oral antidiabetic medication was reported by 70 (81.4%), and 64 (74.4%) had not previously received diabetes education (Table 1). The source-specific definition of "new" versus "long" diabetes duration was not supplied.

As summarized in Table 2, 73 participants (84.9%) were classified as nonadherent, 53 (61.6%) as having high distress, 46 (53.5%) as having high burnout, and 79 (91.9%) as having low self-efficacy. Because the scoring and category thresholds were not provided, these prevalences should be interpreted as classifications assigned in the source data rather than validated clinical prevalence estimates. These categorical frequencies are useful for describing how the participants were classified, but their high proportions should not be compared with external prevalence estimates without verifying item coding and threshold equivalence. Moreover, a binary "adherent/nonadherent" designation should not obscure different clinical requirements for medication taking, food choices, physical activity, glucose monitoring, and foot care.

In three separate simple regressions (Table 3), diabetes distress was inversely associated with self-care (B = −0.395; 95% CI −0.476 to −0.314; $p < 0.001$; $R^2 = 0.530$); diabetes burnout was also inversely associated (B = −0.361; 95% CI −0.458 to −0.264; $p < 0.001$; $R^2 = 0.394$). Self-efficacy had a positive association (B = 0.302; 95% CI 0.025 to 0.579; $p = 0.033$; $R^2 = 0.053$). Because score metrics may differ, the B values are not directly comparable across constructs; likewise, separate-model $R^2$ values do not identify independent explanatory contributions.

**Table 1. Characteristics of Type 2 Diabetes Mellitus Patient Respondents at RSUD Meuraxa, Banda Aceh City (N=86)**

| Demographic Data | f | % |
|---|---|---|
| Gender | | |
| Female | 57 | 66,3% |
| Male | 29 | 33,7% |
| Age (Kemenkes RI) | | |
| Early adulthood (26-35) | 13 | 15,1% |
| Late adulthood (36-45) | 5 | 5,8% |
| Early elderly (46-55) | 24 | 27,9% |
| Late elderly (56-65) | 27 | 31,4% |
| Elderly ( > 65) | 17 | 19,8% |
| Education (kemendikbud) | | |
| Basic | 11 | 12,8% |
| Secondary | 59 | 68,6% |
| Higher | 16 | 18,6% |
| Duration of T2DM | | |
| New | 68 | 79,1% |
| Long | 18 | 20,9% |
| Therapy | | |
| oral | 70 | 81,4% |
| injection | 11 | 12,8% |
| combination | 4 | 4,7% |
| other | 1 | 1,2% |
| Education | | |
| No | 64 | 74,4% |
| Yes | 22 | 25,6% |

**Table 2. Frequency Distribution Based on Research Variable Data of Type 2 Diabetes Mellitus Patient Respondents at Meuraxa Regional General Hospital, Banda Aceh City (N=86)**

| Variables | f | % |
|---|---|---|
| Self-care adherence | | |
| Adherent | 13 | 15,1% |
| Non-adherent | 73 | 84,9% |
| Distress | | |
| High | 53 | 61,6% |
| Moderate | 25 | 29,1% |
| Low | 8 | 9,3% |
| Burnout | | |
| High | 46 | 53,5% |
| Moderate | 34 | 39,5% |
| Low | 6 | 7,0% |
| Self-efficacy | | |
| High | 0 | 0,0% |
| Moderate | 7 | 8,1% |
| Low | 79 | 91,9% |

**Table 3. Separate Unadjusted Associations of Psychological Factors with Reported Self-Care Among Patients with T2DM (N = 86)**

| Variabel | B | R Square | 95% CI | *p-value* |
|---|---|---|---|---|
| Diabetes distress | -0,395 | 0,530 | -0,476 – -0,314 | <0.001 |
| Diabetes burnout | -0,361 | 0,394 | -0,458 – -0,264 | <0.001 |
| Self-efficacy | 0,302 | 0,053 | 0.025 – 0.579 | 0,033 |

## DISCUSSION

This study found a coherent but necessarily preliminary pattern across three separate simple linear regressions in 86 adults with T2DM. Higher diabetes distress was associated with lower self-care scores (B = −0.395; 95% CI −0.476 to −0.314; $R^2$ = 0.530), as was greater burnout (B = −0.361; 95% CI −0.458 to −0.264; $R^2$ = 0.394). Self-efficacy showed a positive association (B = 0.302; 95% CI 0.025 to 0.579; $R^2$ = 0.053). These estimates express average differences in the reported self-care score per one-unit difference in each predictor's scale; they are not standardized effects and cannot be compared as if the scales used identical units (1). Likewise, the $R^2$ values describe variance accounted for by each separate model, not independent contributions within one multivariable model (1). Their relative size is therefore descriptive rather than evidence that distress is the most important causal determinant.

A distinctive feature of these findings is the apparently substantial burden of unsuccessful self-management within the recruited clinic population: 73 of 86 participants (84.9%) were classified as not adhering to self-care, while 53 (61.6%) had high distress and 46 (53.5%) had high burnout according to the reported study classifications. These figures suggest that psychological assessment may be relevant to outpatient nursing encounters, but they require a measurement qualification (4). The underlying cutoffs, domain-aggregation rules, and locally validated interpretations were insufficiently documented, so the proportions should not be generalized as prevalence estimates or equated with objective medication adherence or glycemic outcomes. Because dietary practices, exercise, glucose monitoring, and foot care pose different logistical demands, future reports should display domain-specific self-care patterns in addition to composite classifications (1,3,6,17).

The inverse distress association is clinically plausible because self-care involves recurrent decisions that can generate worry, frustration, and perceived treatment burden (5). Emotional overload might disrupt planning, attention, or sustained engagement; alternatively, repeated difficulty meeting recommended regimens may heighten distress (5). The observational association cannot distinguish these explanations. Jafari et al. investigated distress alongside literacy, burnout, complications, and support using path analysis, emphasizing that emotional strain occurs within a broader psychosocial system (7). Abd El Kader et al. also reported relationships between diabetes distress and self-care activities (8), and related Indonesian evidence has addressed this relationship (15). Taken together, these studies support the relevance of distress as an assessment domain, but differences in participant selection, scales, and analytical adjustment mean that their coefficients cannot be treated as interchangeable with the present unadjusted estimate (14).

Importantly, diabetes distress is not synonymous with a depressive disorder or with a stable personality characteristic (11). It can be responsive to specific pressures—for example, fear of hypoglycemia, perceived criticism about diet, or difficulty navigating a regimen—yet these individual dimensions were not separately analyzed here (9). A high total distress score therefore should prompt further assessment rather than a presumption about its cause or an automatic referral pathway (11). Clinicians may explore whether the distress relates primarily to emotional overload, treatment demands, interpersonal difficulties, or perceived shortcomings in care (11). A longitudinal study measuring these dimensions before and after changes in clinical support would help clarify whether reduced distress precedes improved self-care, follows it, or develops reciprocally (5). The present dataset provides a reason to investigate these possibilities, not proof of one direction.

Burnout showed a second inverse association, suggesting that sustained disengagement and

treatment fatigue merit attention beyond acute disease-related worry (5). The Diabetes Burnout Scale developed by Abdoli et al. was validated in adults with type 1 diabetes, with encouraging internal-consistency findings in that population (10). This is an informative foundation, but transfer of the instrument to Indonesian adults with T2DM requires evaluation of language equivalence, content relevance, factor structure, and reliability in the target group (1). Patients with T2DM may experience distinct treatment trajectories, comorbidities, and medication patterns (1). The differentiation of burnout from distress is therefore both a conceptual and a psychometric challenge. The present findings do not demonstrate that these constructs occupy separable latent dimensions or that they make distinct contributions to self-care after adjustment.

The burnout regression coefficient ($B = -0.361$; $p < 0.001$) and model $R^2$ of 0.394 indicate a strong crude association in the observed sample, but its magnitude could reflect shared measurement content or a common association with treatment burden. The T2DM path-analysis literature provides a useful point of comparison because it examines burnout and distress as components of a wider set of determinants rather than presuming that their effects are additive or independent (7). An informative next analysis would first assess distributions, missingness, reliability, and correlation between constructs, then use a theory-specified model with a limited number of relevant covariates (1). With only 86 participants, indiscriminately adding numerous predictors or complex interaction terms would risk imprecise and unstable estimation. A parsimonious model with transparent diagnostics would be preferable to presenting an underpowered exploratory model as definitive (1).

Self-efficacy contributed a complementary perspective: most participants were categorized as having low self-efficacy (79/86, 91.9%), and those reporting greater confidence had modestly higher self-care scores. This direction accords with the conceptual emphasis on perceived capability in diabetes management and with more recent work drawing on self-care theory (12,13,16). Nevertheless, very unequal categories can limit discrimination, magnify the influence of a few high-scoring observations, and reflect thresholds that do not transport well across clinical populations (4). The nearly universal low-self-efficacy classification warrants verification of the questionnaire version, scoring direction, translation, and threshold before substantive interpretations are made (1). It is possible to observe a positive continuous-score association even when a dichotomized category provides limited information.

The self-efficacy model accounted for a smaller share of the reported self-care variation ($R^2 = 0.053$), and its confidence interval was relatively wide (95% CI 0.025 to 0.579). This combination calls for a measured interpretation (1). Self-efficacy may contribute to behavior, but accessible medication, family arrangements, health literacy, physical limitations, and opportunities to monitor glucose can constrain the enactment of intended self-care despite confidence (3,6). Conversely, self-efficacy may be strengthened through successful experiences of a particular self-care task (1). A domain-specific analysis might therefore be more revealing than a single total score: confidence about medication-taking is unlikely to have precisely the same behavioral relationship as confidence about exercise or foot inspection (4). The present analysis could not examine such heterogeneity.

Viewed through Orem's self-care perspective, the clinical question is not simply whether patients possess sufficient motivation, but whether the demands of a regimen are matched by their abilities, support, and resources (1). A recent T2DM study has operationalized interrelationships involving self-care, self-efficacy, and health-deviation self-care requisites within this framework (13). The current findings are compatible with the value of such an assessment approach, without testing Orem's theoretical mechanisms directly. Integrating distress, fatigue, and perceived capability may identify different types of unmet need: emotional support for an overwhelmed patient, treatment simplification or practical problem-solving for an exhausted patient, and skill-building for a patient who lacks confidence (11). These are examples of possible care responses, not interventions whose effects were evaluated in this observational study.

Context also matters for interpretation. The sample was drawn from a single hospital clinic, and its pattern may differ from that of patients managed in primary care or community settings. Disease duration, insulin treatment, socioeconomic resources, complications, and

family support can be related to psychological burden and self-care; without a joint adjusted model their contributions remain unresolved (1). Family-based diabetes self-management education and supportive group approaches have been examined in related nursing research (19,20), illustrating potentially useful care strategies. Nevertheless, it would be an overextension to infer from the present correlations that reducing distress or burnout, or increasing self-efficacy, will necessarily improve adherence (14). The study offers evidence of co-occurrence and directional associations that can inform hypothesis generation and patient-centered assessment.

**Implications**

For practice, the most defensible implication is to supplement routine biomedical monitoring with a brief, nonjudgmental review of psychological burden and the practical feasibility of self-care (11). A nurse could ask which diabetes task feels hardest, whether prolonged management has become exhausting, how confident the patient feels about solving specific barriers, and what social or material support is available (11). Such assessment should complement—rather than replace—individualized clinical guidance, medication review, and established diabetes-management recommendations (3). High questionnaire scores should lead to dialogue and appropriate evaluation, not automatic attribution of poor self-care to personal failure (11).

A responsive care plan may combine realistic goal setting, teach-back education, problem-solving around individual barriers, family involvement when welcomed, and referral for significant psychological concerns (4,21). Emerging evidence on family-based education and group support justifies considering these as testable strategies rather than proven consequences of the present analysis (19,20). For service development, future quality-improvement work could track distinct dietary, activity, medication, monitoring, and foot-care outcomes alongside distress, burnout, and self-efficacy (21). Such evaluation would reveal whether the proposed psychosocial screening adds practical value beyond routine clinical indicators and whether observed improvements are sustained.

**Limitations**

Several limitations constrain interpretation. The cross-sectional design measured exposure and self-care concurrently, precluding conclusions about temporal ordering, mediation, or causality. Purposive recruitment of 86 patients from one clinic introduces selection concerns and limits generalizability. Regression models were reported separately and without adjustment for potential confounders, including age, diabetes duration, medication complexity, complications, family support, education, and socioeconomic constraints. Because distress, burnout, and self-efficacy may be correlated, the study cannot identify their independent contributions, compare adjusted predictor importance, or establish an explanatory pathway among them. The absence of a reported a priori power calculation also restricts judgments about precision and the feasibility of more complex modeling.

Measurement limitations are equally important. The report does not adequately specify the self-care score aggregation, categorical cutoffs, complete translation and adaptation procedures, or reliability estimates obtained from these particular 86 participants. The original Summary of Diabetes Self-Care Activities assesses distinct behavioral domains rather than proving that any proposed combined total is unidimensional (17). An Indonesian adaptation study reported strong reliability for its version of the Diabetes Management Self-Efficacy Scale (18), but its coefficient cannot be imputed to this study. Similarly, diabetes burnout was originally operationalized in a type 1 diabetes sample (10); measurement equivalence across language and diabetes type cannot be assumed. Self-reported adherence and psychological scores are also vulnerable to recall and social-desirability biases (11).

Finally, analytic assumptions and data quality could not be independently assessed: the available report did not establish whether linearity, influential observations, residual distributions, missing-data patterns, or measurement overlap were examined. The confidence intervals should therefore be read as estimates conditional on the reported model specifications. Future multicenter, longitudinal research should predefine primary outcomes, verify instrument properties in Indonesian T2DM populations, collect relevant covariates and clinical indicators, and evaluate a parsimonious adjusted model (1,14). Where

sample size and assumptions permit, investigators could examine construct overlap and domain-specific self-care outcomes before considering mediation or interaction hypotheses. These steps would advance beyond the present descriptive associations without retroactively attributing multivariable conclusions to them.

## CONCLUSION

In 86 adults attending a T2DM outpatient clinic, higher distress and burnout were associated with lower self-reported self-care scores, whereas greater self-efficacy was associated with higher scores in separate unadjusted linear regressions. These relationships cannot establish temporality, independent predictor importance, or causal intervention targets. Nursing assessment can consider psychological and self-care needs, but confirmatory studies with validated scales and adjusted analyses are necessary.

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### AUTHOR CONTRIBUTIONS

RM contributed to the conceptualization and design of the study, data collection, data analysis, and preparation of the initial manuscript draft. FK contributed to the methodology, data interpretation, critical revision of the manuscript, and approval of the final version. MT contributed to data collection, interpretation of the research findings, critical revision of the manuscript, and approval of the final version. All authors have read and approved the final manuscript for publication.

### CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest related to this research or the publication of this article.

### DATA AVAILABILITY STATEMENT

The data supporting the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to privacy considerations and ethical restrictions concerning the confidentiality of participant information.

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