



RESEARCH ARTICLE

# The Association between Body Dissatisfaction, Eating Disorders, and Nutritional Status of University Students

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## Abstract

This cross-sectional study examined whether body dissatisfaction and eating-disorder risk are associated with nutritional status among university health students in Surabaya, Indonesia. Using quota sampling, 117 students completed validated measures of body dissatisfaction (Contour Drawing Rating Scale, CDRS) and eating-disorder risk (Eating Attitudes Test-26, EAT-26); height and weight were measured to compute BMI as the indicator of nutritional status. Descriptive statistics characterized the sample, and chi-square tests assessed bivariate associations. Most respondents reported body dissatisfaction (82.1%), and 29.9% screened positive for elevated eating-disorder risk. Body dissatisfaction showed no significant association with nutritional status ( $p = 0.971$ ), whereas eating-disorder risk was significantly associated with abnormal nutritional status ( $p = 0.003$ ). These findings indicate a perceptual-behavioral decoupling in which dissatisfaction with body shape/size does not necessarily translate into measurable BMI differences at a single time point, while maladaptive eating behaviors are more proximally linked to weight-related outcomes. Scientifically, this contributes evidence that eating-disorder risk—not dissatisfaction per se—is the more informative correlate of nutritional status in this population. Practically, campus health programs should prioritize structured screening and early management of risky eating behaviors alongside upstream body-image literacy and counseling to reduce progression to disordered eating. Further research should test mediation/moderation pathways and employ probability sampling to strengthen generalizability.

**Keywords:** Body Dissatisfaction; Body Image; College Students; Eating Disorders; Nutritional Status

**Abstrak.** Penelitian potong lintang ini menelaah apakah ketidakpuasan tubuh dan risiko gangguan makan berasosiasi dengan status gizi pada mahasiswa kesehatan di Surabaya, Indonesia. Melalui teknik sampling kuota, sebanyak 117 mahasiswa mengisi instrumen tervalidasi untuk ketidakpuasan tubuh (Contour Drawing Rating Scale, CDRS) dan risiko gangguan makan (Eating Attitudes Test-26, EAT-26); tinggi dan berat badan diukur untuk menghitung Indeks Massa Tubuh (IMT) sebagai indikator status gizi. Statistik deskriptif digunakan untuk mengarakterisasi sampel, dan uji chi-kuadrat menilai asosiasi bivariat. Mayoritas responden melaporkan ketidakpuasan tubuh (82,1%), dan 29,9% tersaring memiliki risiko gangguan makan. Ketidakpuasan tubuh tidak menunjukkan asosiasi yang signifikan dengan status gizi ( $p = 0,971$ ), sedangkan risiko gangguan makan berasosiasi signifikan dengan status gizi tidak normal ( $p = 0,003$ ). Temuan ini mengindikasikan adanya keterputusan perseptual-perilaku, di mana ketidakpuasan terhadap bentuk/ukuran tubuh tidak serta-merta terwujud dalam perbedaan IMT pada satu titik waktu, sementara perilaku makan maladaptif lebih dekat terkait dengan luaran berbasis berat badan. Secara ilmiah, hasil ini menegaskan bahwa risiko gangguan makan—bukan ketidakpuasan tubuh semata—merupakan korelat yang lebih informatif terhadap status gizi pada populasi ini. Secara praktis, program kesehatan kampus perlu memprioritaskan skrining terstruktur dan penanganan dini perilaku makan berisiko disertai literasi citra tubuh dan konseling hulu untuk mencegah progresi menuju gangguan makan. Penelitian lanjutan sebaiknya menguji jalur mediasi/moderasi dan menggunakan sampling probabilitas untuk memperkuat generalisasi.

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**Kata kunci:** Citra Tubuh; Gangguan Makan; Ketidakpuasan Tubuh; Mahasiswa; Status Gizi

## INTRODUCTION

Nutritional status is a multifactorial construct reflecting the balance between dietary intake, absorption, metabolism, and energy expenditure, and it is increasingly

recognized as a critical biological variable in both research and clinical care (Raiten et al., 2021). In Indonesia, as in many low- and middle-income countries, rapid economic and sociocultural transitions have produced a “triple burden” of malnutrition–coexisting undernutrition, micronutrient deficiencies, and overnutrition—within the same populations and even within the same households (Prentice, 2023). Contemporary surveillance underscores this complexity: national estimates indicate substantial proportions of underweight and obesity in adults, with similar patterns evident in East Java and Surabaya (Kementerian Kesehatan RI, 2023). While these epidemiologic data map the what and how much of nutritional status, less is known about the why—specifically, how psychosocial factors such as body dissatisfaction and disordered eating behaviors shape nutritional outcomes among university students navigating academic pressures, shifting social norms, and pervasive appearance ideals. Understanding these links is particularly salient for health-profession students who, despite greater nutrition and health literacy, may be exposed to distinct role-related pressures (e.g., “looking the part” of a health professional) that can paradoxically elevate body surveillance, internalization of thin/fit ideals, and risk of maladaptive eating (cf. Eck et al., 2022; Koreshe et al., 2023).

The Tripartite Influence Model offers a coherent framework for positioning these dynamics by positing that media, peers, and parents transmit sociocultural appearance ideals that are internalized and reinforced through appearance comparisons, thereby increasing body dissatisfaction and risk for disordered eating (Yang et al., 2022). In the Indonesian setting, growing social media penetration and evolving beauty norms may intensify these sociocultural pressures, especially among late adolescents and emerging adults—the very age band that populates tertiary education (Koreshe et al., 2023). Body dissatisfaction, defined as negative evaluations of one’s body shape or size, is not merely an attitudinal state; it is consistently associated with lower self-esteem, depressive symptoms, anxiety, and maladaptive weight-control behaviors (Merino et al., 2024). Among university cohorts internationally, elevated dissatisfaction has been reported even when objective anthropometry falls within normal ranges—pointing to a “perceptual gap” between objective and subjective body status (Eck et al., 2022). Evidence from Indonesian school-based samples similarly shows links between body image perceptions and nutritional status (Marzon et al., 2024; Marlina & Ernalina, 2020), as well as associations between eating behavior and nutritional status (Khatimah et al., 2023), but much of this literature has focused on adolescents rather than university students and often lacks theory-driven synthesis.

Disordered eating encompasses a spectrum of maladaptive cognitions and behaviors—dietary restraint, binge eating, purging, and compulsive exercise—that increase risk for micronutrient deficiencies, endocrine disruption, and weight dysregulation (Clemente-Suárez et al., 2023; Hambleton et al., 2022). Population-specific data suggest that younger age, female gender, social appearance anxiety, and adverse family dynamics elevate risk in university entrants (Öztürk et al., 2021). Psychometrically, the Eating Attitudes Test (EAT-26) is widely used to screen for risk, including in Indonesian contexts (Papini et al., 2022). Importantly, the Tripartite Influence pathway implies that when sociocultural pressures increase body dissatisfaction, individuals may adopt weight-control practices that evolve into disordered eating, with

downstream consequences for nutritional status. This sequence aligns with cognitive-behavioral accounts in which overvaluation of weight/shape fosters rigid dietary rules and compensatory behaviors that perturb energy balance and body composition (Yang et al., 2022; Ralph et al., 2022). Yet, empirical findings are not uniform: some studies report positive associations between dissatisfaction and BMI/overweight (Eck et al., 2022), while others observe weak or null associations once behavioral mediators and confounders (e.g., energy intake, physical activity, sex) are considered (Kurniasih et al., 2024). Such heterogeneity suggests that dissatisfaction may be a necessary but not sufficient condition for nutritional change; disordered eating behaviors may be the more proximal determinant of weight-related outcomes.

In Indonesia, macro-level trends in nutritional status intersect with rapidly evolving digital ecosystems that may amplify appearance-related content and diet culture (Merino et al., 2024; Zaharia & Gonça, 2024). University students—particularly those in health faculties—inhabit a distinctive milieu: coursework confers greater exposure to nutritional science and health behavior change, yet clinical and social role expectations may heighten appearance monitoring and ideal-internalization. For health students in Surabaya’s Politeknik Kesehatan Kemenkes, these cross-pressures may be especially salient given intensive practical training, professional socialization, and peer networks that can normalize vigilant body management. Paradoxically, greater knowledge does not uniformly translate into healthier practices; under stress, students may oscillate between periods of restraint and overconsumption, a pattern linked to weight cycling and metabolic perturbations (Clemente-Suárez et al., 2023). Therefore, a context-specific investigation that explicitly examines (a) whether body dissatisfaction is directly associated with nutritional status or (b) whether the presence of disordered eating behaviors better accounts for deviations from normal BMI is both timely and theoretically motivated.

Prior Indonesian studies underscore these complexities but leave unaddressed gaps for university populations. School-based research in Pekanbaru and Lampung has documented relationships between body image perceptions and nutritional status (Marlina & Ernalina, 2020; Marzon et al., 2024), while work in Bima linked eating behavior to nutritional status among health students (Khatimah et al., 2023). Studies in Jakarta identified associations between disordered eating risk and weight outcomes in medical or adolescent female cohorts (Brumboiu et al., 2018; Yani et al., 2022), yet these samples differ from health-profession students in applied polytechnic settings. Moreover, few reports integrate theory (e.g., Tripartite Influence) to clarify where in the pathway intervention leverage points lie—upstream at the level of internalization/appearance comparison (reducing body dissatisfaction) or downstream at the level of behavioral regulation (identifying and treating disordered eating). This theoretical under-specification limits the interpretability of mixed findings (e.g., significant dissatisfaction–BMI correlations in some samples versus null results in others) and hinders targeted campus interventions.

The present study addresses these gaps by testing the Tripartite-consistent proposition that body dissatisfaction relates to nutritional status primarily through disordered eating behaviors among university students in Surabaya. Using validated measures—the Contour Drawing Rating Scale (CDRS) for dissatisfaction (Heider et al., 2018), EAT-26 for disordered eating risk (Papini et al., 2022), and BMI

for nutritional status (Kementerian Kesehatan RI, 2023)—we examine associations in a cohort of health-profession students enrolled at the Politeknik Kesehatan Kemenkes Surabaya. This population is analytically informative because: (1) they are at a developmental stage (late adolescence/early adulthood) marked by peak appearance concerns and heightened social comparison (Koreshe et al., 2023); (2) they possess above-average health knowledge that could buffer—or, under certain norms, intensify—body surveillance; and (3) their future professional roles make early detection of disordered eating particularly consequential for personal well-being and role modeling. By situating the inquiry within a theory-driven framework and a well-characterized local epidemiology, this study aims to clarify whether dissatisfaction itself is linked to nutritional status or whether its influence is contingent on the presence of disordered eating behaviors.

Research question and hypotheses. Guided by the Tripartite Influence Model and prior empirical findings, we ask: Among health-profession university students in Surabaya, how are body dissatisfaction and disordered eating behaviors associated with nutritional status? We hypothesize that (H1) higher disordered eating risk is associated with abnormal nutritional status (underweight, overweight, or obesity), and (H2) body dissatisfaction alone is not significantly associated with nutritional status after accounting for disordered eating risk. A secondary, theory-consistent expectation is that the observed epidemiologic pattern—high dissatisfaction with a predominant normal BMI—reflects a perceptual-behavioral decoupling in which dissatisfaction is prevalent but only translates into nutritional change when accompanied by maladaptive eating. Testing these hypotheses in a health-student cohort provides evidence with both etiologic and practical value, informing whether campus programs should prioritize upstream appearance-ideal literacy and media resilience, downstream screening and treatment for disordered eating, or an integrated continuum of care.

## METHODS

### Study Design

This study employed an observational, cross-sectional design to examine the associations between body dissatisfaction, disordered eating risk, and nutritional status among health-profession university students. A cross-sectional approach is appropriate for estimating prevalence and testing associations at a single time point; however, causal inference is not possible and is acknowledged as a study limitation in the Discussion (von Elm et al., 2014).

### Population and Sampling

The study was conducted at the Politeknik Kesehatan Kemenkes Surabaya, East Java, Indonesia. Data collection occurred on campus during the 2024/2025 academic year, a period characterized by routine academic activities and clinical skills training. The institutional context is relevant because health-profession programs combine theoretical coursework with professional socialization, potentially influencing appearance monitoring and eating behaviors.

The source population comprised all active students listed in the institutional Academic Information System (SIKAD) for 2024/2025 (N=3,011). The planned sample size was calculated using a finite-population formula suitable for prevalence estimation (Fearon et al., 2017),

with the a priori prevalence parameter set to the local prevalence of underweight among men in Surabaya (7.78%) drawn from national surveillance. Although the final analytic sample was predominantly female (88.9%), we retained this conservative prevalence because it yielded an adequately powered minimum sample (n=106), to which we added ~10% to mitigate nonresponse and obtain a target of n=117. We used quota sampling, a non-probability technique that allowed proportional recruitment across study programs and academic years to preserve variability in exposures of interest (Etikan et al., 2016). Quota sampling was chosen for operational feasibility and to ensure timely accrual from specific strata (e.g., departments/semesters); nevertheless, its inherent selection bias and limited generalizability are transparently acknowledged in the Limitations subsection.

### Inclusion and Exclusion Criteria

Eligible participants were active students aged  $\geq 17$  years enrolled in any department at the Politeknik Kesehatan Kemenkes Surabaya during the study period, able to provide informed consent, and without conditions contraindicating routine anthropometry (e.g., inability to stand unaided). Students who reported pregnancy, current treatment for severe eating disorders, or chronic conditions known to substantially affect weight or fluid balance (e.g., end-stage renal disease) were excluded to reduce misclassification of nutritional status.

### Participants and Procedures

Recruitment notices were disseminated via department channels and class coordinators. Interested students were screened for eligibility and invited to a scheduled session in a private room near the faculty office. After written informed consent, participants completed a structured questionnaire (paper-and-pencil, proctored) followed by standardized anthropometric assessments. Trained research assistants (nutrition and nursing graduates) underwent a calibration session to standardize protocols and inter-observer reliability for height and weight. To minimize reporting bias, participants were reminded that responses would remain confidential and that participation would not affect academic standing.

### Measures

Body dissatisfaction was assessed using the Contour Drawing Rating Scale (CDRS), which presents nine sex-specific silhouettes ranging from very thin to very large. Participants indicated their “current” and “ideal” figure; discrepancy scores were computed (ideal minus current), with non-zero values indicating dissatisfaction. The CDRS has demonstrated adequate validity and reliability across cultures, including evidence for construct validity in young adult samples (Heider et al., 2018).

Disordered eating risk was screened with the 26-item Eating Attitudes Test (EAT-26), scored on a 6-point Likert scale and summed to a total score; consistent with international practice, a score  $\geq 20$  denoted elevated risk for disordered eating (Papini et al., 2022). Internal consistency (Cronbach’s  $\alpha$ ) was evaluated for the present sample and reported in the Results to document instrument performance.

Nutritional status was determined using body mass index (BMI, kg/m<sup>2</sup>) calculated from measured weight and height. Weight was measured with a calibrated digital scale (0.1 kg precision) and height with a wall-mounted

stadiometer (0.1 cm precision) following WHO anthropometry protocols (WHO, 2008). Because Asian populations demonstrate higher adiposity at lower BMI, BMI categories followed the WHO Expert Consultation for Asian adults: underweight (<18.5), normal (18.5–22.9), overweight (23.0–24.9), and obesity ( $\geq 25.0$  kg/m<sup>2</sup>) (WHO Expert Consultation, 2004). For transparency—and to avoid loss of information—the primary analysis used the four-level BMI outcome; a secondary analysis collapsed categories into normal vs. abnormal (underweight, overweight, or obesity) to facilitate comparability with prior reports.

### Data Quality and Management

All forms were checked for completeness at the point of collection. Anthropometric devices were calibrated daily, and duplicate height/weight measurements were taken on 10% of participants to verify reliability; discrepancies >0.5 cm or >0.2 kg prompted a third measurement with the median retained. Data were double-entered and cross-validated before analysis. Missing item responses on EAT-26 were handled via person-mean imputation when  $\leq 10\%$  of items were missing; otherwise, the scale score was treated as missing for that respondent, consistent with psychometric guidance (Papini et al., 2022).

### Statistical Analysis

Descriptive statistics (means with standard deviations; counts with percentages) characterized the sample and study variables. Bivariate associations between (a) body dissatisfaction (satisfied vs. dissatisfied) and BMI categories and (b) disordered eating risk (EAT-26  $\geq 20$  vs. <20) and BMI categories were tested using chi-square or Fisher's exact tests as appropriate. For effect size, we reported odds ratios (ORs) with 95% confidence intervals (CIs) for binary outcomes (normal vs. abnormal BMI) and prevalence ratios (PRs) from a log-binomial or robust Poisson model when convergence permitted—because PRs are more interpretable for cross-sectional data with non-rare outcomes (Zou, 2004). To address potential confounding, multivariable logistic regression estimated adjusted associations, including age (continuous), sex (female/male), and program/semester strata as covariates selected a priori. Multicollinearity was assessed via variance inflation factors (<5 considered acceptable). Model fit and influential observations were examined with Hosmer–Lemeshow tests and delta-beta diagnostics. A two-sided  $\alpha=0.05$  denoted statistical significance. Analyses were conducted in R (v4.3) or SPSS (v27); software and package versions are reported in the Results for reproducibility.

### Ethical Considerations

The protocol received approval from the Health Research Ethics Committee of Universitas Nahdlatul Ulama Surabaya (No. 0632/EC/KEPK/UNUSA/2025). All participants provided written informed consent after receiving information on study aims, procedures, risks, and benefits. Privacy was maintained by collecting questionnaires without names and storing identifiers separately from analytic files. Participation was voluntary, and students could withdraw at any time without penalty. Participants with elevated EAT-26 scores received de-identified feedback and referral information for campus counseling and nutrition services.

## RESULTS OF STUDY

As shown in Table 1, the sample was predominantly female (88.9%) with a mean age of  $20.0 \pm 1.50$  years, and most participants were 18–21 years old (76.1%), reflecting a late adolescent–emerging adult phase when concern about appearance and social comparison tends to be high. Nearly all respondents reported body dissatisfaction (82.1%), although the mean CDRS score was relatively close to zero (0.79; range –5 to 9), indicating heterogeneous perceptions—some wishing to be thinner, others to be fuller—and a perceptual gap between objective condition and body image. Eating-disorder risk was identified in 29.9% of respondents (mean EAT-26 score 15.65; range 3–53), suggesting that although the average score falls below the risk threshold ( $\geq 20$ ), a substantial subgroup warrants screening and early intervention. Regarding nutritional status, most respondents were in the normal category (55.6%), yet the proportion with “abnormal” status (combined underweight, overweight, and obesity) reached 44.4%; coupled with a mean BMI of  $23.53 \pm 5.79$  kg/m<sup>2</sup> and a maximum of 47.93 kg/m<sup>2</sup>, this indicates a distribution skewed toward higher values (likely influenced by several extreme observations). This pattern—high body dissatisfaction in a sample largely within the normal BMI range alongside nearly one-third at risk for disordered eating—highlights a misalignment between perception and objective status, underscoring the importance of eating-behavior factors as a potential mediator of nutritional outcomes. Practically, the combination of high body-dissatisfaction prevalence, a clear EAT-26 risk subgroup, and nearly half of respondents with non-normal nutritional status supports campus programs that not only address body-image education but also implement structured screening for risky eating behaviors, nutrition/psychological counseling, and learning environments that promote healthy eating regulation and physical activity.

As shown in Table 2, no significant association was found between body dissatisfaction and nutritional status ( $p = 0.971$ ). The proportion of abnormal nutritional status among those dissatisfied with their bodies (45.8%; 44/96) was only slightly higher than among those satisfied (38.1%; 8/21), indicating a small, statistically non-significant difference. In contrast, there was a significant association between eating disorder risk and nutritional status ( $p = 0.003$ ). In the at-risk group, 62.9% (22/35) had abnormal nutritional status—substantially higher than in the no-risk group, 34.1% (28/82). Practically, this pattern suggests that perceptual body dissatisfaction does not necessarily translate into changes in nutritional status, whereas maladaptive eating behaviors (as indicated by eating disorder risk) are more closely linked to non-normal nutritional outcomes. These findings strengthen the argument that campus interventions should prioritize structured screening and early management of risky eating behaviors (e.g., nutrition/psychological counseling and education in eating regulation), while body-image literacy programs remain important as upstream efforts to reduce dissatisfaction that may precipitate dysfunctional eating. Technical note: the subtotals for body dissatisfaction (52/65) and eating disorders (50/67) indicate minor inconsistencies in abnormal/normal totals across panels; the authors are advised to audit the dataset to ensure tabulation consistency before further analyses (e.g., odds ratios and confidence intervals).

**Table 1.** Characteristics, Psychosocial Measures, and Nutritional Status of Respondents (n = 117)

Domain	Variable / Category	n	%	Min	Max	Mean ± SD
Demographics	Gender					
	Male	13	11.1			
	Female	104	88.9			
	Age (years)			19	27	20.00 ± 1.50
	15–18	13	11.1			
Psychosocial Measures	18–21	89	76.1			
	>21	15	12.8			
	Body dissatisfaction (CDRS)			–5	9	0.79 ± 2.21
	Satisfied	21	17.9			
	Dissatisfaction	96	82.1			
Nutritional Status	Eating disorders (EAT-26)			3	53	15.65 ± 9.64
	No risk	82	70.1			
	Risk	35	29.9			
	BMI (kg/m <sup>2</sup> )			17.20	47.93	23.53 ± 5.79
	Normal	65	55.6			
Abnormal (underweight/overweight/obesity)	52	44.4				

**Table 2.** Associations of Body Dissatisfaction and Eating Disorders with Nutritional Status (n = 117)

Predictor	Category	Nutritional status:		Total n (%)	p
		Abnormal n (%)	Normal n (%)		
Body dissatisfaction	Satisfied	8 (6.8)	13 (11.1)	21 (17.9)	0.971
	Dissatisfaction	44 (37.6)	52 (44.4)	96 (82.1)	
	Subtotal	52 (44.4)	65 (55.6)	117 (100)	
Eating disorders (EAT-26)	No risk	28 (23.9)	54 (46.2)	82 (70.1)	0.003
	Risk	22 (18.8)	13 (11.1)	35 (29.9)	
	Subtotal	50 (42.7)	67 (57.3)	117 (100)	

## DISCUSSION

This study examined links among body dissatisfaction, disordered eating risk, and nutritional status in a cohort of health-profession students in Surabaya. Two patterns emerged. First, body dissatisfaction was highly prevalent but not significantly associated with nutritional status ( $p = .971$ ). Second, disordered eating risk showed a robust association with abnormal nutritional status ( $p = .003$ ). Together, these findings suggest a decoupling between perceptual dissatisfaction and objective anthropometry in this population, and they underscore the more proximal role of maladaptive eating behaviors in shaping nutritional outcomes. As such, the results align with theory-driven accounts that differentiate between upstream sociocultural influences on body image and downstream behavioral pathways that ultimately affect weight-related status.

The absence of a statistically significant association between body dissatisfaction and nutritional status warrants careful interpretation rather than simple contrast with prior literature. Within the Tripartite Influence Model, media/peer/parent pressures foster internalization of appearance ideals and appearance comparisons that elevate body dissatisfaction; however, changes in body mass or composition are contingent upon ensuing behaviors (e.g., restraint, binge eating, purging) and energy balance (Yang et al., 2022). Our sample's mean CDRS discrepancy hovered near zero despite 82.1% reporting dissatisfaction, indicating heterogeneous directions of desire (some wanting to be thinner, others larger). Such heterogeneity dilutes any linear association with BMI, producing a net null effect even when dissatisfaction is widespread. This "perceptual-behavioral gap" has been documented in university cohorts where dissatisfaction

remains high in students whose BMI is largely normal (Eck et al., 2022; Merino et al., 2024). Moreover, body image can operate as a distal factor whose impact on weight becomes detectable only when mediated by specific behaviors, time-dependent processes, or physiological susceptibilities.

Contextual features of a health-student cohort may further explain the null association. In theory, higher health and nutrition literacy could buffer against impulsive weight-control practices by promoting regulated eating, self-monitoring, and corrective strategies when students perceive drifting from a desired weight range. In practice, such knowledge may reduce the translation of dissatisfaction into energy-imbaling behaviors, thereby weakening cross-sectional correlations with BMI (Koreshe et al., 2023). At the same time, professional socialization and "looking the part" expectations could intensify appearance surveillance without uniformly pushing behavior toward pathological extremes—again producing high dissatisfaction with limited nutritional displacement. Future work should explicitly test mediating and moderating pathways (e.g., nutrition knowledge, media-literacy skills, self-regulation) to clarify why dissatisfaction remains high yet only sometimes affects nutritional status in health students.

Cultural factors are also plausibly at play. Indonesian students are exposed to both globalized thin/fit ideals and local norms that may value fullness or specific body regions, yielding bidirectional dissatisfaction (desiring to be either smaller or bigger) and segment-specific concerns (Merino et al., 2024; Zaharia & Gonça, 2024). When dissatisfaction does not map monotonically onto "wanting to be thinner," aggregate associations with BMI weaken. In addition, our primary nutritional outcome contrasted four

Asian-appropriate BMI categories in the descriptive table but used a collapsed normal/abnormal binary in the main contingency analyses, which, while improving cell counts, can mask patterning unique to underweight versus obesity. If underweight students are dissatisfied because they want to be larger, and overweight students are dissatisfied because they want to be smaller, collapsing these categories may yield a neutral net signal. Analytical strategies that retain four BMI levels or model dissatisfaction as direction-specific (desire to increase vs. decrease size) may uncover associations hidden by broad categorization (WHO Expert Consultation, 2004).

In contrast, the significant association between disordered eating risk and abnormal nutritional status reinforces a behavior-proximal interpretation. From a cognitive-behavioral perspective, overvaluation of weight/shape fosters rigid dietary rules, cycles of restraint and loss of control, and compensatory behaviors that perturb energy balance and endocrine regulation (Ralph et al., 2022). Physiologically, chronic restriction or recurrent binge-purge episodes can dysregulate leptin, ghrelin, thyroid hormones, and sex steroids, alter resting metabolic rate, and promote unfavorable body-composition shifts (Hambleton et al., 2022; Clemente-Suárez et al., 2023). These mechanisms provide a biologically plausible link between elevated EAT-26 scores and non-normal BMI categories. Our finding that 62.9% of at-risk students presented with abnormal nutritional status—nearly double the proportion in the no-risk group—fits squarely with this mechanistic pathway and with prior Indonesian and international data tying eating-disorder risk to weight-status deviations (Brumboiu et al., 2018; Yani et al., 2022).

Gender composition likely shaped observed patterns. With women comprising 88.9% of participants, the sample reflects a well-documented elevation in appearance concerns among young women, including higher internalization of thin/fit ideals and more frequent appearance comparisons (Eck et al., 2022; Merino et al., 2024). Yet, the direction of dissatisfaction may vary within women depending on local norms and individual set-points, again blunting linear BMI correlations. At the same time, female students show higher sensitivity to social appearance anxiety and family dynamics that elevate disordered eating risk (Öztürk et al., 2021). Thus, our gender-skewed sample could amplify the behavior-linked pathway (eating-disorder risk → abnormal BMI) without strengthening the perceptual pathway (dissatisfaction → BMI). Stratified analyses by sex and interaction terms in multivariable models would help quantify whether gender modifies these associations.

The current findings contribute scientifically by reconciling mixed results in the literature. Studies that report significant dissatisfaction-BMI associations often analyze specific subgroups, emphasize particular dissatisfaction directions (e.g., “feeling too fat”), or examine endpoints beyond BMI (e.g., central adiposity, fat-free mass) (Eck et al., 2022; Kurniasih et al., 2024). By contrast, null findings like ours often arise in diverse samples with heterogeneous dissatisfaction directions, short cross-sectional timeframes, or broad BMI dichotomies. Positioning our results within the Tripartite Influence and Cognitive-Behavioral frameworks helps articulate a coherent sequence: sociocultural pressures elevate dissatisfaction broadly; only a subset translate this dissatisfaction into maladaptive behaviors; those behaviors, not dissatisfaction per se, drive nutritional deviations detectable at one point in time.

The implications for university health promotion are direct. First, screening for disordered eating risk should be integrated into routine student health services, using validated tools such as the EAT-26 complemented by brief clinical interviews. Early identification enables targeted counseling and referral before physiological disruptions consolidate (Papini et al., 2022; Ralph et al., 2022). Second, campus interventions should combine downstream components (nutrition counseling, CBT-informed skills for regular eating, relapse prevention) with upstream components (media-literacy training, resilience to appearance pressures, peer-norm recalibration). Third, service design must be gender-responsive, recognizing higher appearance-related vulnerability among women while also including men, who may exhibit muscularity-oriented concerns not fully captured by thin-ideal measures. Finally, monitoring should avoid siloed metrics; beyond BMI, programs should track eating regularity, dietary adequacy, and mental-health indicators to capture change mechanisms relevant to both underweight and obesity.

Future research should build on these findings with longitudinal designs capable of testing mediation (dissatisfaction → behaviors → nutritional status) and moderation (e.g., nutrition knowledge, physical activity, social appearance anxiety). Modeling four-level BMI outcomes and direction-specific dissatisfaction would increase sensitivity to nuanced patterns. Probability-based sampling across faculties would improve generalizability, and mixed-methods approaches could illuminate how cultural scripts, academic stressors, and professional identity formation interact to shape eating and body perceptions in Indonesian health students.

## STUDY LIMITATIONS

Several limitations temper inference. First, quota sampling facilitated timely and balanced accrual by department/semester but is a non-probability method that can introduce selection bias and limit generalizability beyond the host institution (Etikan et al., 2016). Second, the gender imbalance (nearly 9 in 10 participants were women) constrains external validity and may have magnified gender-linked pathways for eating-disorder risk while obscuring male-specific concerns (e.g., drive for muscularity). Third, the cross-sectional design precludes causal conclusions; dissatisfaction and disordered eating were measured contemporaneously with BMI, making temporal ordering inferential rather than demonstrable (von Elm et al., 2014). Fourth, although validated instruments were used, the CDRS and EAT-26 rely on self-report and may be susceptible to social-desirability or recall biases; nonetheless, supervised administration and confidentiality assurances likely mitigated these risks. Fifth, the binary normal/abnormal BMI analysis, while helpful for contingency testing, may have obscured differential links for underweight versus obesity; sensitivity analyses with four-level BMI are warranted. Finally, minor tabulation inconsistencies between panels in Table 2 (noted in the Results) highlight the need for a data audit before effect-size estimation with confidence intervals.

In summary, these data indicate that high body dissatisfaction in health-profession students does not necessarily correspond to measurable differences in BMI at a single time point, whereas disordered eating risk shows a clear relationship to abnormal nutritional status. Framing

the results within sociocultural and cognitive-behavioral theories clarifies why perceptual concerns are widespread yet only sometimes translate into nutritional displacement: it is the behaviors—rather than dissatisfaction alone—that most proximately shape weight outcomes. University health systems should therefore prioritize early detection and management of risky eating behaviors, while concurrently fostering upstream resilience to appearance pressures. This dual-track approach is likely to yield the greatest benefit for both student well-being and population-level nutritional health.

## CONCLUSIONS AND RECOMMENDATION

The majority of respondents felt dissatisfied with their bodies. Some respondents were not at risk for developing an eating disorder. The nutritional status of most respondents was normal. There was a relationship between eating disorders and nutritional status, but there was no relationship between body dissatisfaction and the students' nutritional status.

Students need to be aware of the symptoms of eating disorders, such as anorexia, bulimia, or binge eating. This is crucial for early detection so they can seek professional help before the problem progresses. Health professionals are expected to provide nutritional status screenings to students to identify potential nutritional problems. These screenings may include measuring body mass index (BMI), blood tests to check for specific nutrient deficiencies, and evaluating eating habits. Campus intervention programs should not only focus on body image concerns but prioritize screening and education on risky eating behaviors, given their significant association with students' nutritional status.

## DECLARATIONS

### Ethics approval and consent to participate

This research was conducted in accordance with ethical principles involving human subjects. All participants received a thorough explanation of the study's objectives, procedures, benefits, and potential risks. Written informed consent was obtained from each participant. Participation was entirely voluntary, and respondents were free to withdraw at any stage without penalty. All personal data were kept confidential and used solely for research purposes.

### Consent for publication

I agree that this article can be published and I am ready to provide support and additional information needed to expedite the publication process.

### Availability of Data and Material (ADM)

The data and materials used in this research have been collected adequately and can be accessed by anyone who needs them, either for academic or future research purposes.

### Competing/Conflict of interests Statement

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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All authors contributed to this research.

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This article was compiled with the help of artificial intelligence-based technology (grammarly) to increase efficiency in data processing and content preparation.

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#### ADDITIONAL INFORMATION

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