



Research Article

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Non-linear Burnout Trajectory and Academic Motivation Across Training Stages in Obstetrics and Gynecology Residency

Birama Robby Indraprasta^{1*}, Ernawati Ernawati², Hermanto Tri Joewono²¹Department of Medical Education, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia; ²Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

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Abstract

Background: Burnout is prevalent among postgraduate medical trainees, yet stage-stratified data in obstetrics and gynecology (Ob-Gyn) residency remain sparse. Self-Determination Theory (SDT) offers a framework for linking burnout domains with academic motivation, but this relationship has not been studied in this population. **Objectives:** To map burnout prevalence and domain severity across four stages of an Ob-Gyn residency program and examine associations between burnout domains and academic motivation subtypes. **Methods:** This cross-sectional study enrolled 94 Ob-Gyn residents (semesters 2–9) from the Faculty of Medicine, Universitas Airlangga, undergoing clinical training at a major tertiary teaching hospital in Surabaya, Indonesia. Instruments were the Maslach–Trisni Burnout Inventory and the Academic Motivation Scale, an SDT-based measure of academic motivation. **Results:** Overall burnout prevalence was 25.5%, varying markedly across stages: 44.0% (Stage I), 28% (Stage II), 7.4% (Stage III), and 23.5% (Stage IV) ($p=0.026$), forming a non-linear, U-shaped trajectory. Stage I exhibited significantly higher emotional exhaustion than Stage III ($p=0.033$). Personal accomplishment (PA) correlated positively with autonomous, self-driven motivation (all intrinsic subtypes and identified regulation) and with introjected regulation, and negatively with amotivation ($p<0.05$). External regulation was highest in Stage I and lowest in Stage IV ($p=0.032$), independently of burnout. **Conclusions:** Burnout concentrates at early and late training stages rather than accumulating uniformly. PA co-occurs with autonomous motivation, suggesting a protective resource-like role. Wellbeing resources should be front-loaded at program entry and back-loaded at program exit rather than distributed evenly across training years, with deliberate reinforcement of clinical competence.

Keywords: Burnout; Motivation; Obstetrics-Gynecology; Residency.

مسار الإرهاق غير الخطي والدافع الأكاديمي عبر مراحل التدريب خلال فترة الإقامة في طب النساء والتوليد

الخلاصة

الخلفية: الإرهاق منتشر بين الأطباء المتدربين بعد التخرج، ومع ذلك لا تزال البيانات المرحلية في برامج الإقامة في أمراض النساء والتوليد قليلة. تقدم نظرية تقرير المصير (SDT) إطاراً لربط مجالات الاحتراق الوظيفي بالدافع الأكاديمي، لكن هذه العلاقة لم تدرس في هذه الفئة. **الأهداف:** رسم خريطة انتشار الإرهاق وشدة المجالات عبر أربع مراحل من برنامج إقامة النساء والولادة وفحص الروابط بين مجالات الإرهاق وأنواع الدافع الأكاديمي. **الطرق:** شملت هذه الدراسة المقطعية 94 مقيماً في أمراض النساء والتوليد (الفصول الدراسية 2–9) من كلية الطب بجامعة إيلانغا، حيث خضعوا لتدريب سريري في مستشفى تعليمي رئيسي في سورابايا، إندونيسيا. كانت الأدوات هي جرد الاحتراق الوظيفي لماسلاش-تريسني ومقياس الدافع الأكاديمي، وهو مقياس قائم على SDT للدافع الأكاديمي. **النتائج:** كان انتشار الاحتراق الإجمالي 25.5٪، مع تفاوت ملحوظ عبر المراحل: 44.0٪ (المرحلة الأولى)، 28٪ (المرحلة الثانية)، 7.4٪ (المرحلة الثالثة)، و23.5٪ (المرحلة الرابعة) ($p=0.026$)، مما شكل مساراً غير خطي على شكل حرف U. أظهرت المرحلة الأولى إرهاقاً عاطفياً أعلى بكثير من المرحلة الثالثة ($p=0.033$). ارتبط الإنجاز الشخصي (PA) بشكل إيجابي بالدافع الذاتي (جميعها أنواع فرعية جوهرية وتنظيم محدد) ومع التنظيم الداخلي، وسلبياً مع فقدان الدافعية ($p<0.05$). كان التنظيم الخارجي هو الأعلى في المرحلة الأولى وأدنى مستوى في المرحلة الرابعة ($p=0.032$)، بغض النظر عن الاحتراق النفسي. **الاستنتاجات:** يتركز الإرهاق في مراحل التدريب المبكرة والمتأخرة بدلاً من أن يتراكم بشكل موحد. يحدث الدافع النفسي مع الدافع الذاتي، مما يشير إلى دور شبيه الموارد الوقائية. يجب تحميل موارد الصحة في البداية عند دخول البرنامج وإعادة تحميلها عند الخروج من البرنامج بدلاً من توزيعها بالتساوي عبر سنوات التدريب، مع تعزيز متعمد للكفاءة السريرية.

*Corresponding author: Birama R. Indraprasta. Department of Medical Education, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia; Email: birama.robby.in-2020@fk.unair.ac.id

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INTRODUCTION

Burnout is classified as an occupational syndrome arising from unmanaged chronic workplace stress [1,2]. Postgraduate medical training combines sustained patient contact with steep hierarchical pressure and workloads that leave little margin for recovery. Maslach and colleagues describe the syndrome through emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishment (PA) [1]. A meta-analysis of medical and surgical residents found a pooled burnout rate of 51%, with Ob-Gyn estimates approaching 53%

[3]. Systematic reviews of OB/GYN trainees confirm this pattern across several countries and identify long duty hours and limited autonomy as recurring contributors [4,5]. Burnout in this group has been linked to increased medical errors, compromised patient safety, and attrition from the profession [6,7]. Ob-Gyn residency sits at the demanding end of postgraduate training, since residents manage recurring obstetric emergencies, complex surgical caseloads, overnight call duties, and concurrent academic requirements [8,9]. What the literature has not answered clearly is whether burnout risk accumulates

steadily across training years or concentrates at particular stages. Most studies capture a single snapshot of an entire cohort without separating early, mid, and senior residents, even though burnout varies substantially across career points [10,11]. One study found that changing the training schedule alone shifted resident burnout, which suggests the syndrome responds to where a resident sits in the program structure rather than being a fixed trait [12]. If risk is concentrated rather than evenly spread, the timing of institutional support matters more than its volume. A second and less examined question is how burnout relates to academic motivation. Self-Determination Theory (SDT) places motivation on a continuum running from intrinsic motivation and identified regulation at the autonomous end, through introjected and external regulation, to amotivation [13,14]. Autonomous motivation predicts deeper learning and persistence, while controlled motivation and amotivation track with disengagement [15,16]. Perceived competence occupies a central position here, because it is one of the three basic psychological needs whose satisfaction supports autonomous functioning at work and in study [17]. The few studies applying SDT to residents suggest the relationship runs in both directions [18,19]. Motivation also shifts during training. Cross-sectional comparisons show the balance between autonomous and controlled motivation changes as medical students progress [20], qualitative work describes a developmental trajectory of autonomous motivation in graduate medical learners [21], and assessment design influences whether residents engage for internalized reasons or for external contingencies [22]. Previous studies have documented burnout across medical specialties [23-26], but the literature lacks within-program, stage-stratified data for obstetrics and gynecology that examine burnout domains and academic motivation together within a validated theoretical framework. To our knowledge, this is the first study to investigate the non-linear trajectory of burnout alongside academic motivation profiles across the training stages of a single Ob-Gyn residency program. Three questions drove the design. Do burnout prevalence and domain severity differ across the four training stages? Do academic motivation profiles vary by stage? And what pattern of association links burnout domains with motivational subtypes, in particular whether any domain shows a consistently protective relationship with motivation?

Key Messages

Burnout prevalence follows a U-shaped trajectory across Ob-Gyn residency stages, peaking in Stage I (44%) and rebounding in Stage IV (23.5%), not accumulating linearly. Personal accomplishment is the only burnout domain that co-occurs with autonomous academic motivation, suggesting it may function as a protective resource rather than a pure deficit marker. Wellbeing resources in residency programs should be front-loaded and back-loaded rather than distributed evenly across all training years.

METHODS

Study design and setting

This was a cross-sectional analytic study conducted among Ob-Gyn residents from the Faculty of Medicine, Universitas Airlangga, undergoing clinical training at a major tertiary teaching hospital in Surabaya, Indonesia. Data collection ran from November to December 2025. Residents actively enrolled in semesters 2 through 9, undergoing clinical training during the data collection period, and providing written informed consent were eligible. Those in semester 1 were excluded because the first-semester curriculum at this institution is classroom-based, with no clinical service responsibilities. Residents on academic leave or otherwise inactive in clinical training fell outside the eligible sampling frame. Personal circumstances such as recent crises, physical or psychiatric illness, and substance use were not used as exclusion criteria, since these belong to the naturalistic context in which burnout develops, and their possible confounding influence is addressed in the Limitations. All 94 eligible residents were enrolled (total sampling). All eligible residents participated, and all questionnaires were complete and unique. The training stage followed the program's own curricular structure, defined as Stage I (semesters 2-3), Stage II (semesters 4-5), Stage III (semesters 6-7), and Stage IV (semesters 8-9).

Instruments

Burnout was measured with the Maslach-Trisni Burnout Inventory (M-TBI), an Indonesian-language adaptation of the original Maslach Burnout Inventory [27]. The M-TBI contains 22 items distributed across three subscales: EE (9 items; range 0-54), DP (5 items; range 0-30), and PA (8 items; range 0-48). Each item is rated on a seven-point frequency scale (0=never, 6=daily). The instrument has demonstrated strong internal consistency (Cronbach's $\alpha=0.916$) and acceptable fit in confirmatory factor analysis (RMSEA=0.073, CFI=0.907) [27]. A resident was classified as experiencing burnout if at least one domain reached its established cut-off: EE ≥ 27 , DP ≥ 10 , or PA ≤ 33 [28,29]. Academic motivation was measured with the Indonesian-language Academic Motivation Scale (AMS), adapted by Marvianto and Widhiarso [30] and further validated with Rasch analysis by Julianto and colleagues [31]. The AMS covers seven subscales: intrinsic motivation to know (IMTK), intrinsic motivation toward accomplishment (IMTA), intrinsic motivation to experience stimulation (IMTE), identified regulation (IR), introjected regulation (INR), external regulation (ER), and amotivation (AMO). Each of the 28 items uses a seven-point Likert scale (1=does not correspond at all; 7=corresponds exactly). Psychometric properties are satisfactory (Cronbach's $\alpha=0.87$; Rasch person reliability=0.89) [30,31]. Both instruments were administered in their validated Indonesian versions. All participants were Indonesian citizens and native

Indonesian speakers. No international residents were enrolled, so no English-language version was required. A separate pilot test was not conducted because both instruments had already been adapted and psychometrically validated for Indonesian samples in the published studies cited above [27,30,31], and were used here without modification.

Data collection procedures

Data were collected using a structured questionnaire administered through a secure online survey platform (Jotform Inc., San Francisco, CA, USA). A paper version was prepared as an alternative, but all 94 participants chose the online format. The research team sent individual survey links directly to each resident by email and personal text message, without involving program faculty or supervisors. Residents completed the questionnaire in private, at a time and place of their own choosing, with no supervisor or program administrator present. Responses were confidential rather than anonymous. Identifying information collected for administrative tracking was separated from the responses and replaced with study codes before analysis so that all analyses were performed on de-identified data, and individual results were never disclosed to program leadership. These procedures were intended to reduce social desirability bias.

Ethical considerations

Written informed consent was obtained from each participant prior to data collection. Ethical clearance was granted by the Health Research Ethics Committee, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia (Protocol No. 354/EC/KEPK/FKUA/2025). This study was conducted in accordance with the Declaration of Helsinki (2013). Participant confidentiality was maintained throughout, and no identifying information is reported.

Statistical analysis

Continuous variables are reported as medians with interquartile ranges (IQR), while categorical variables are reported as frequencies with percentages. Shapiro–Wilk testing indicated non-normal distributions for all continuous outcomes (all $p < 0.05$), so non-parametric procedures were used throughout. Between-stage comparisons for burnout domain scores and AMS subscores used the Kruskal–Wallis test, with pairwise follow-up by the Dunn test and Bonferroni correction. Between-stage differences in burnout prevalence were tested with Pearson's chi-square, followed by column proportion comparison with Bonferroni adjustment. Associations between burnout domains and AMS subscales were examined with Spearman's rank correlation. All tests were two-tailed, with α set at 0.05. Analyses were performed using IBM SPSS Statistics (version 31.0; IBM Corp., Armonk, NY, USA). No a

priori sample size calculation was performed, because the study enrolled the entire eligible population rather than a sample, so the study size was fixed by the size of that population ($n = 94$, total sampling). Sensitivity analyses (G*Power 3.1) indicated that, with $n = 94$, α of 0.05 two-tailed and 80% power, the smallest detectable effects were a Cohen's w of 0.34 for the 2×4 chi-square test of burnout prevalence ($df = 3$), a Cohen's f of 0.35 for the four-group comparisons of burnout domain and motivation subscale scores, and a rank correlation of approximately 0.29 in absolute value after allowing for the efficiency of Spearman's coefficient relative to Pearson's. These thresholds correspond approximately to a medium effect by Cohen's conventions, and smaller effects may have gone undetected.

RESULTS

All 94 eligible residents participated (response rate 100%). Stage I comprised 25 residents (26.6%), Stage II 25 (26.6%), Stage III 27 (28.7%), and Stage IV 17 (18.1%). Most participants were female (63.8%), with a mean age of 31.07 ± 2.80 years (range 26–40). A total of 60.6% were partnered, and the majority relied on family or spousal financial support (55.3%). Demographic details are presented in Table 1.

Table 1: Demographic characteristics of participants ($n = 94$)

Variable	n(%)
<i>Sex</i>	
Male	34(36.2)
Female	60(63.8)
<i>Marital status</i>	
Unpartnered	37(39.4)
Partnered	57(60.6)
<i>Employment status</i>	
Civil servant	12(12.8)
Military/Police	14(14.9)
Private	68(72.3)
<i>Primary funding source</i>	
Self-funded	25(26.6)
Family/Spouse	52(55.3)
Scholarship	17(18.1)
<i>Training stage</i>	
Stage I (Semester 2–3)	25(26.6)
Stage II (Semester 4–5)	25(26.6)
Stage III (Semester 6–7)	27(28.7)
Stage IV (Semester 8–9)	17(18.1)

Twenty-four residents (25.5%) met the criteria for burnout. Stage-specific figures varied considerably, with 44.0% (11/25) in Stage I, 28.0% (7/25) in Stage II, 7.4% (2/27) in Stage III, and 23.5% (4/17) in Stage IV. Chi-square testing confirmed that this distribution was not random ($p = 0.026$). Post hoc column proportion comparison identified Stage I and Stage III as the statistically distinguishable poles, with Stage II and Stage IV falling in between (Table 2). At the domain level, EE and PA scores differed significantly across stages (Kruskal–Wallis: EE $p = 0.047$, PA $p = 0.034$), while DP did not ($p = 0.828$). Stage I had the highest EE mean rank (59.74) and Stage III the lowest (38.78), with Dunn–Bonferroni testing confirming this contrast ($p = 0.033$).

Table 2: Burnout prevalence and domain scores across training stages

Domain	Stage I (n=25)	Stage II (n=25)	Stage III (n=27)	Stage IV (n=17)	p-value
EE (mean rank)	59.74	45.80	38.78	45.85	0.047
DP (mean rank)	48.92	45.64	45.11	51.94	0.828
PA (mean rank)	42.88	39.84	60.19	45.41	0.034
Burnout prevalence	11(44.0%) ^a	7(28.0%) ^{a,b}	2(7.4%) ^b	4(23.5%) ^{a,b}	0.026

Mean ranks derived from Kruskal–Wallis test. Burnout prevalence compared by Pearson's chi-square, followed by pairwise column-proportion comparisons with Bonferroni correction. Superscript letters (a,b) summarize those pairwise comparisons. Proportions that do not share a common letter differ significantly at $p < 0.05$, while proportions sharing a letter do not differ. Stage I (a) therefore differs from Stage III (b), whereas Stage II and Stage IV (a,b) differ from either. EE: emotional exhaustion; DP: depersonalization; PA: personal accomplishment.

PA moved in the opposite direction. Stage III held the highest mean rank (60.19), well above Stage II (39.84), a difference that also survived correction ($p = 0.042$). Of the seven AMS subscales, only external regulation (ER) showed a statistically significant between-stage difference ($p = 0.032$). Stage I residents scored highest on

ER (mean rank 59.36), and Stage IV residents scored lowest (36.15). Dunn–Bonferroni follow-up confirmed that only the Stage I vs. Stage IV contrast reached significance after correction ($p = 0.039$). The remaining six subscales did not vary significantly across stages (all $p > 0.05$) (Table 3).

Table 3: Academic motivation subscale scores across training stages

Domain	Stage I (n=25)	Stage II (n=25)	Stage III (n=27)	Stage IV (n=17)	p-value
IMTK (mean rank)	53.48	41.72	51.39	41.03	0.258
IMTA (mean rank)	50.56	42.20	55.17	38.62	0.149
IMTE (mean rank)	46.34	48.66	50.61	42.56	0.793
IR (mean rank)	51.16	39.78	54.00	43.15	0.188
INR (mean rank)	53.20	48.28	46.39	39.74	0.462
ER (mean rank)	59.36	42.12	48.65	36.15	0.032
AMO (mean rank)	47.00	51.64	41.83	51.15	0.543

Mean ranks derived from Kruskal–Wallis test. IMTK: intrinsic motivation to know; IMTA: intrinsic motivation toward accomplishment; IMTE: intrinsic motivation to experience stimulation; IR: identified regulation; INR: introjected regulation; ER: external regulation; AMO: amotivation.

Spearman's correlations showed that the three burnout domains related to motivation in different ways (Table 4). Higher EE scores were associated with greater amotivation ($\rho = +0.475$, $p < 0.001$) and with lower scores on two intrinsic motivation subtypes: IMTK ($\rho = -0.328$, $p = 0.001$) and IMTE ($\rho = -0.251$, $p = 0.015$). DP followed the same direction, with a positive correlation with amotivation ($\rho = +0.387$, $p < 0.001$) and a negative correlation with IMTE ($\rho = -0.208$, $p = 0.044$). PA

showed a different pattern. It was positively associated with all three intrinsic subtypes (IMTK: $\rho = +0.331$; IMTA: $\rho = +0.359$; IMTE: $\rho = +0.359$; all $p \leq 0.001$), with identified regulation ($\rho = +0.410$, $p < 0.001$), and with introjected regulation ($\rho = +0.298$, $p = 0.004$). PA was negatively associated with amotivation ($\rho = -0.310$, $p = 0.002$). External regulation showed no significant correlation with any of the three burnout domains (all $p > 0.05$).

Table 4: Spearman correlations between burnout domains and academic motivation subscales

Domain	EE ρ	p-value	DP ρ	p-value	PA ρ	p-value
IMTK	-0.328	0.001	-0.178	0.085	+0.331	0.001
IMTA	-0.085	0.414	-0.036	0.732	+0.359	<0.001
IMTE	-0.251	0.015	-0.208	0.044	+0.359	<0.001
IR	-0.128	0.218	-0.127	0.222	+0.410	<0.001
INR	+0.110	0.291	-0.028	0.785	+0.298	0.004
ER	+0.194	0.061	+0.154	0.138	+0.129	0.216
AMO	+0.475	<0.001	+0.387	<0.001	-0.310	0.002

ρ : Spearman's rank correlation coefficient; EE: emotional exhaustion; DP: depersonalization; PA: personal accomplishment; IMTK: intrinsic motivation to know; IMTA: intrinsic motivation toward accomplishment; IMTE: intrinsic motivation to experience stimulation; IR: identified regulation; INR: introjected regulation; ER: external regulation; AMO: amotivation.

DISCUSSION

This study produced three findings that warrant attention. The first is the non-linear distribution of burnout across training stages. The second is the unexpected motivational correlates of personal accomplishment. The third is the stage-specific decline in externally regulated motivation. Taken together, they argue against treating a residency cohort as a single population with a uniform risk profile, and they suggest that the dimension along which support is targeted should be the training stage rather than the program as a whole. The 25.5% overall prevalence sits well below the 51% figure in large-scale

meta-analyses [3,10], though direct comparison is complicated by differences in case definitions and cultural context. The aggregate figure is, however, less informative than the stage-by-stage breakdown. At Stage I, nearly half of residents (44.0%) met burnout criteria. By Stage III, that proportion had fallen to one in fourteen (7.4%). Stage IV then showed a partial rise to 23.5%. A simple accumulation-of-stress model would not predict this shape. Stage I concentration is consistent with what has been described in the early transition to clinical service. Unfamiliar hierarchies, procedural uncertainty, and an abrupt shift in personal responsibility all arrive at once [6,11]. For Ob-Gyn in particular, that transition

includes early exposure to obstetric emergencies and overnight delivery-suite duty, a combination that the recent specialty-specific review identified as a consistent driver of exhaustion in junior trainees [5]. Stage III may reflect a period of relative equilibrium in which residents have enough clinical experience to manage routine demands, and the final examination period has not yet arrived. The Stage IV uptick aligns with end-of-program stressors, including completion of thesis, national assessments, and uncertainty about career placement [8,9]. Comparable between-group variation in burnout across residency levels has been observed in surgical cohorts, though within-program non-linear data remain sparse [11,32]. A global meta-regression of postgraduate trainees similarly reported wide variation in burnout estimates that case-mix and training context did not fully explain, which is consistent with stage being an unmeasured source of heterogeneity in pooled figures [33]. Compared with Ob-Gyn training programs in other countries, the overall prevalence in this cohort is low. A meta-analysis of Ob-Gyn residents reported a pooled burnout prevalence of 44% [4], and a recent systematic review of sixteen studies found rates between 46% and 86%, with the highest figures among residents in Sudan and Saudi Arabia, above 80%, and the lowest in the Netherlands at 13% [5]. In the United Kingdom, 43% of Ob-Gyn trainees registered with the Royal College of Obstetricians and Gynecologists met burnout criteria [7] and estimates for United States trainees generally fall between 40% and 75% [9]. Pooled regional figures for residents of all specialties are 57% in Asian countries, 28% in Europe, and 52% in North America [3]. Our overall figure of 25.5% is below nearly all of these. Two considerations argue against reading it as evidence of genuinely lower risk. First, between-country variation in burnout is shaped by health system structure, working-hour regulation, cultural context, and differences in instruments and cutoff criteria [5,33]. Second, and closer to the argument of this study, our Stage I prevalence of 44.0% is almost identical to the pooled international figure for Ob-Gyn residents [4], and the international literature repeatedly points to early training as the period of highest risk. Junior Ob-Gyn residents showed higher emotional exhaustion in a Canadian national survey [8], and the first year of residency emerged as a recurrent risk factor in the specialty-wide systematic review [5]. The gap between our aggregate figure and international estimates therefore reflects, at least in part, how a single prevalence number collapses very different stage-specific risks of 44.0%, 28.0%, 7.4%, and 23.5% into one value. The same caution applies to between-country comparisons built on aggregate rates. Beyond the absolute figures, the shape of the curve matters for how the result is interpreted. Much of the resident-burnout literature implicitly assumes a dose-response relationship in which cumulative exposure to clinical demands raises burnout monotonically over time. A U-shaped distribution fits better with a model in which burnout

tracks the fit between current demands and currently available resources, both of which change as a resident move through the program. Under that reading, the low Stage III figure is not a measurement artifact but a genuine window in which accumulated competence has caught up with the demands of the role before the distinct pressures of the final stage take hold. EE and DP followed the expected pattern, with both associated with higher amotivation and lower intrinsic drive, consistent with prior work [29]. PA moved differently. It was positively associated with all three intrinsic motivation subtypes, with identified and introjected regulation, and negatively associated with amotivation. No other burnout domain showed this range and consistency. This specificity of PA to motivational profiles echoes findings from a multi-specialty resident study in which motivational type mediated the relationship between stressors and reduced personal accomplishment [34]. A parallel structural pattern has been reported with coping strategies. Specifically, among Indonesian resident physicians, PA was positively associated with adaptive coping, whereas EE and DP showed stronger associations with dysfunctional coping [35]. The Job Demands–Resources (JD-R) framework offers one way to read this finding. JD-R distinguishes between demands, which deplete energy, and resources, which preserve or restore it [36,37]. PA may function less as a burnout symptom and more as a personal resource, an accumulated sense of competence and meaningful contribution that sustains motivational investment even when exhaustion or depersonalization is present. This reading fits the recovery literature, which treats restored personal resources as the mechanism that buffers the carry-over of strain from one demanding period to the next [38]. It is also consistent with SDT's treatment of perceived competence as a basic psychological need [13,17], and with reviews showing that need satisfaction at work predicts both performance and well-being [39]. Framed this way, PA is not simply the inverse of burnout but a candidate lever for intervention, since competence can be deliberately built through graded responsibility and timely feedback. ER was highest in Stage I and lowest in Stage IV, while intrinsic and identified regulation showed no significant change across stages. This points to a shift in the type of motivation that drives engagement, not a change in its overall level. Early-stage residents, still finding their footing within the program's norms and assessment structures, appear more responsive to external contingencies. By Stage IV, the significance of those contingencies diminishes. The pattern is consistent with cross-phase comparisons in medical school, where the relative weight of controlled motivation declines as learners advance [20], and with accounts of autonomous motivation developing over the course of graduate training [21]. Whether this finding reflects genuine motivational internalization or simply reduced sensitivity to external pressure cannot be resolved using cross-sectional data. Therefore,

longitudinal follow-up is needed. In practical terms, three implications follow for program design. First, wellbeing resources should be front-loaded and back-loaded rather than spread evenly, with structured onboarding and mentorship concentrated in Stage I and renewed attention to thesis, examination, and career-transition stress in Stage IV. The finding that a schedule change alone moved resident burnout supports the more general point that institutional design, not only individual resilience, determines where the burden falls [12]. Second, because PA travels with autonomous motivation, interventions that build a genuine sense of clinical competence, such as graded operative responsibility, deliberate feedback, and visible recognition of skill acquisition, may protect motivation even when exhaustion cannot be fully removed. This places competence-building alongside workload reduction as a legitimate target. Third, the early dominance of external regulation suggests that assessment in the first stages can be used constructively, designed to scaffold competence rather than only to gate progression, supporting the gradual internalization of motivation observed by the senior stages [22].

Strengths and Limitations

This study has several strengths. To our knowledge it provides the first within-program, stage-stratified analysis of burnout and academic motivation in an Ob-Gyn residency. Enrolling the entire eligible population with a 100% response rate removes non-response bias, which is a common threat in survey-based burnout research. Both instruments were validated Indonesian adaptations with published psychometric properties, administered in the participants' native language. The findings were also interpreted within two established frameworks, self-determination theory and the Job Demands–Resources model, rather than reported descriptively. Finally, the stage-stratified design addresses the training stage directly, a variable rarely separated in pooled estimates [33]. Cross-sectional design is the main constraint. Patterns across training stages reflect between-cohort differences, not within-person change over time. Causal claims (for example, that growing clinical competence increases PA, which in turn sustains intrinsic motivation) cannot be supported by this data structure. The study was confined to a single specialty at a single institution, which limits generalizability. Self-reported measures carry a risk of response bias, and potentially relevant variables such as call frequency, caseload volume, and mentorship access were not collected. Each of these could plausibly account for part of the stage-to-stage variation we attribute to the training phase, and their omission means the stage effect reported here should be read as a composite rather than an isolated cause. The census design captured the entire eligible population, but the sensitivity analyses indicate that the study could not reliably detect effects below a Cohen's w of 0.34, a Cohen's f of 0.35, or a rank correlation of 0.29 in absolute value. Subgroup estimates

at the level of individual stages rest on between 17 and 27 residents each and therefore carry wide uncertainty, so the stage-specific prevalences should be read as a pattern rather than as precise point estimates. Potential personal confounders such as acute personal crises, bereavement, serious physical or psychiatric illness, and substance use were not screened, and their unmeasured influence on burnout scores cannot be ruled out. Longitudinal and multi-site studies that track the same residents over time, and that record workload and support variables directly, would allow the U-shaped pattern to be tested as a within-person trajectory rather than a between-cohort snapshot.

Conclusion

The earliest and latest training stages concentrated burnout in this Ob-Gyn residency, rather than spreading it uniformly across the program. The lowest rate occurred in the third stage. Among the three burnout domains, personal accomplishment was the only one to correlate positively with all intrinsic motivation subtypes and with identified and introjected regulation and negatively with amotivation. This pattern was not shared by emotional exhaustion or depersonalization. External regulation was highest in the earliest stage and lowest in the final stage, independently of burnout status. Wellbeing support should be concentrated at program entry and again at program exit rather than spread evenly across training years, with structured adaptation and mentorship for early-stage residents and renewed attention to examination and career-transition stress for those nearing completion. Sustained attention to residents' sense of clinical competence throughout the program may help maintain academic motivation at all stages.

Conflict of interests

The authors declared no conflict of interest.

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Data sharing statement

The data that supports the findings of this study are available from the corresponding author upon a reasonable request.

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