

ORIGINAL RESEARCH

Testing Self-determination theory in residency: a multi-site path model of leadership, motivation, and burnout

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Abstract

Background: Resident burnout persists in graduate medical education (GME), yet many wellness initiatives emphasize individual coping rather than the supervisory practices and learning environments that shape residents' daily work. Self-determination theory (SDT) suggests that autonomy-supportive leadership (ASL)—behaviours such as acknowledging perspectives, providing meaningful rationales, offering guidance, and conveying respect—may support residents' psychological needs and foster more self-determined motivation.

Objective: To examine an SDT-informed pathway linking residents' perceptions of ASL with psychological need satisfaction, motivational quality, and well-being/ill-being.

Method: In Spring 2023, residents and fellows across 15 teaching hospitals within a U.S. healthcare system completed an anonymous online survey assessing ASL, basic psychological need satisfaction, motivational quality, and indicators of well-being and ill-being. Pearson correlations and path analysis with 10,000 bootstrap samples were used to examine relationships among study variables.

Results: A total of 278 trainees responded (16.8%). ASL was positively associated with need satisfaction and motivational quality and negatively associated with ill-being. The hypothesized path model showed good fit ($\chi^2(3) = 2.04$, $p = .56$, CFI = 1.00, RMSEA < .001, SRMR = .013). ASL predicted greater need satisfaction, which predicted higher motivational quality. Both were associated with greater well-being and lower ill-being. The model explained 46% of the variance in well-being and 35% in ill-being.

Conclusions: Autonomy-supportive leadership was associated with more adaptive motivational functioning and better resident well-being, suggesting a potentially modifiable target for faculty development and learning climate improvement. These findings provide integrated, context-specific support for SDT processes in residency training.

Évaluation de la théorie de l'autodétermination en résidence : un modèle multisite portant sur le leadership, la motivation et l'épuisement professionnel

Résumé

Contexte : L'épuisement professionnel des résidents persiste dans la formation médicale postdoctorale, alors que de nombreuses initiatives en matière de bien-être mettent l'accent sur les stratégies d'adaptation individuelles plutôt que sur les pratiques de supervision et les environnements d'apprentissage qui façonnent le travail quotidien des résidents. La théorie de l'autodétermination (TAD) suggère qu'un leadership favorisant l'autonomie (LFA) — caractérisé par des comportements tels que reconnaître les points de vue, fournir des explications pertinentes, offrir des conseils et témoigner du respect — peut répondre aux besoins psychologiques des résidents et favoriser une motivation davantage autodéterminée.

Objectif : Examiner un parcours inspiré de la TAD reliant les perceptions des résidents concernant le LFA à la satisfaction de leurs besoins psychologiques, à la qualité de leur motivation et à leur bien-être ou mal-être.

Méthode : Au printemps 2023, des résidents et des fellows issus de 15 hôpitaux universitaires d'un système de santé américain ont rempli un questionnaire anonyme en ligne. Celui-ci évaluait l'autonomie, la satisfaction des besoins psychologiques fondamentaux, la qualité de la motivation et des indicateurs de bien-être et de mal-être. Des corrélations de Pearson et une analyse des pistes causales avec 10 000 échantillons *bootstrap* ont été utilisées pour examiner les relations entre les variables de l'étude.

Résultats : Au total, 278 personnes en formation ont répondu (16,8 %). Le LFA était positivement associé à la satisfaction des besoins et à la qualité de la motivation, et négativement associé au mal-être. Le modèle des pistes causales testé a montré un bon ajustement ($\chi^2(3) = 2,04$, $p = 0,56$, CFI = 1,00, RMSEA < 0,001, SRMR = 0,013). Le LFA prédisait une plus grande satisfaction des besoins, laquelle prédisait à son tour une meilleure qualité de la motivation. Ces deux éléments étaient associés à un plus grand bien-être et à un moindre mal-être. Le modèle expliquait 46 % de la variance du bien-être et 35 % de celle du mal-être.

Conclusions : Le LFA était associé à un fonctionnement motivationnel plus adaptatif et à un meilleur bien-être des résidents, ce qui suggère une cible potentiellement modifiable pour le développement du corps enseignant et l'amélioration du climat d'apprentissage. Ces résultats apportent un soutien intégré et propre au contexte de la résidence aux processus de la théorie de l'autodétermination (TAD).

Introduction

Burnout remains pervasive in graduate medical education (GME). A recent meta-analysis of more than 30,000 residents found that nearly half met criteria for burnout, with similar rates also documented

among practicing physicians.^{1,2} Comparable patterns have been observed in Canadian postgraduate medical education (PGME) contexts, where high rates of resident distress and burnout continue to be reported across specialties.³ Large-scale analyses suggest that distress is driven less by deficits in in-

dividual resilience than by features of the work environment, including administrative burden, workflow inefficiencies, lack of control, poor teamwork, and diminished meaning (i.e., a reduced sense that one's work is purposeful, valued, or aligned with personal and professional identity).^{2,4} Yet many wellness initiatives in GME continue to emphasize personal coping and "add-on" activities, with comparatively less attention to the supervisory practices and local learning climates that shape residents' daily experience.^{5,6}

Self-determination theory (SDT) offers a mechanism-focused framework for understanding how these aspects of the work environment may influence resident well-being.⁷ SDT proposes that people function optimally when three basic psychological needs are supported: autonomy (experiencing volition rather than control), competence (feeling effective and capable of growth), and relatedness (feeling respected and connected).⁸ Environments that support these needs are associated with greater engagement, persistence, and well-being, whereas environments that undermine them are associated with depletion, burnout, and disengagement.^{9,10}

SDT also distinguishes among different qualities of motivation. Motivation exists along a continuum ranging from amotivation (no sense of purpose or volition) to more controlled forms of motivation, such as external regulation (driven by rewards or punishments) and introjected regulation (driven by guilt, shame, or self-pressure), and then to more autonomous forms, such as identified/integrated regulation (acting from personally endorsed values) and intrinsic motivation (acting from interest and enjoyment). These distinctions are well-established within SDT and have been applied extensively in educational and health professions contexts.^{8,11} When residents act primarily from external pressure, guilt, or self-imposed contingency, they may still perform at a high level, but research has associated more controlled forms of motivation with less adaptive educational and well-being outcomes.^{11,12} By contrast, when residents experience their work as personally meaningful or aligned with their values, their motivation is more self-determined and is associated with greater vitality, persistence, and well-

being.¹³ Thus, such environments may influence well-being not only directly, but also through their effects on motivational quality.¹³

Among medical students, autonomy-supportive teaching has been linked to greater autonomous motivation, perceived competence, patient-centered attitudes, and psychological well-being.^{14,12,15} Studies in residency likewise suggest that supporting autonomy, competence, and relatedness is associated with less exhaustion, greater meaning, and better functioning.^{16,17,18} These findings have increased interest in autonomy-supportive leadership (ASL): supervisory practices characterized by observable interpersonal behaviours (e.g., acknowledging perspectives, providing meaningful rationales, offering appropriate choice and structure, rather than relying primarily on pressure or control to motivate behaviour). Although ASL is theorized to support trainees' motivational processes, it is conceptually defined in terms of behaviours rather than outcomes and is therefore empirically distinct from both psychological need satisfaction and motivational regulation.

While the core relationships proposed by SDT are well-established across educational and healthcare contexts, less is known about how these processes function as an integrated system within residency training environments, particularly within a single analytic model. Residency represents a distinct context in which trainees simultaneously occupy roles as both learners and frontline care providers, often under conditions of high workload, limited autonomy, and significant evaluative pressure. These features may shape both the experience and consequences of motivational processes in ways that are not fully captured in undergraduate settings.

Prior conceptual work suggests that autonomy-supportive leadership may help reconcile the tension between supervision and progressive responsibility in residency and may therefore represent an important target for faculty development and assessment reform.^{19,20,21} However, empirical SDT-based studies in residency remain relatively limited, are often conducted in single sites or single programs, and have rarely tested the full theoretically specified

pathway linking supervisory behaviour, psychological need satisfaction, motivational quality, and resident well-being/ill-being within a single analytic model. As such, context-specific, theory-informed empirical work is still needed to inform system-level interventions in GME.

Study purpose

The purpose of this study was to test an SDT-informed path model linking residents' perceptions of autonomy-supportive leadership with psychological need satisfaction, motivational quality, and well-being/ill-being outcomes within a single multi-site GME system. Drawing on earlier SDT-guided work within HCA Healthcare and developed in consultation with SDT scholars, we examined whether residents who perceived more autonomy-supportive leadership also reported greater need satisfaction, more self-determined motivation, greater well-being, and lower ill-being.

We hypothesized that:

H1: ASL would be positively associated with residents' basic psychological need satisfaction.

H2: Need satisfaction would be positively associated with motivational quality.

H3: Need satisfaction and motivational quality would be associated with greater well-being and lower ill-being.

By examining these relationships across multiple hospitals and specialties within one healthcare system, we tested the plausibility of a theory-informed, multistep motivational pathway within a single integrated analytic model, while holding broader institutional leadership and regulatory context relatively constant. This approach allowed us to examine the full SDT sequence—from supervisory behaviour to psychological needs, motivation, and well-being—within a unified framework.

Methods

Design and setting

We conducted a cross-sectional survey study in Spring 2023 within HCA Healthcare, a large U.S. graduate medical education system comprising over 250 programs and more than 50 teaching hospitals. The study included programs across 15 HCA Healthcare teaching hospitals. We recruited participating sites through a call for volunteers to Designated Institutional Officials across HCA Healthcare's sponsoring institutions. Although the participating sites differed in specialty mix, clinical context, and local training environment, they operated within the same broader institutional system and governance structure. We designed the study as a theory-informed examination of motivational processes within that shared GME context, building on prior SDT-informed wellness research conducted in the same system.¹⁷

Participants

We invited all residents and fellows affiliated with participating programs by email to complete an anonymous online survey. In total, 1,651 trainees across 11 specialties and 15 teaching hospitals were eligible. Participating specialties included dermatology ($n = 2$ programs), emergency medicine (2), family medicine (8), internal medicine (9), obstetrics and gynecology (2), orthopedic surgery (1), psychiatry (3), general surgery (3), transitional year (4), and two subspecialty fellowships (cardiovascular disease and pulmonary/critical care).

Procedures and ethics

We sent residents a personalized link to the online survey by email, followed by reminder messages. We provided program directors only with aggregate completion counts; they could encourage participation but could not identify respondents. Residents participated voluntarily and anonymously, and we reported all results in aggregate to protect confidentiality. Survey completion indicated participants' free and informed consent. The HCA Healthcare In-

stitutional Review Board reviewed the project and deemed it exempt from full ethical review in accordance with institutional policy (REB 2025-457).

Measures

Given the multi-site nature of this study and its integration within a broader system-level assessment initiative, we used abbreviated, theory-aligned measures to balance construct validity with feasibility and response burden. We selected items from established SDT instruments or developed them in collaboration with SDT scholars to map directly onto core theoretical constructs. This approach reflects common practice in large-scale organizational research, where shorter scales are often necessary to support participation while preserving conceptual fidelity.

All measures are summarized in Appendix A, including scale source and development (provenance), example items, scoring details, and internal consistency estimates.

Autonomy-supportive leadership

Residents rated the extent to which attending physicians engaged in autonomy-, competence-, and relatedness-supportive behaviours over the past three months. Six items (two per need) included prompts such as “Listen to my opinions,” “Give me useful feedback,” and “Respect me” (1 = strongly disagree to 5 = strongly agree). Reliability was strong ($\alpha = .89$).

These items captured residents’ perceptions of observable supervisory behaviours rather than internal motivational states. Although prior SDT studies have used instruments such as the Work Climate Questionnaire, we selected the present items to align with an existing system-level assessment framework and reflect the specific context of clinical supervision in residency.

Basic psychological need satisfaction

Six items assessed the extent to which residents experienced autonomy, competence, and relatedness in their work environment (two per need). Example items included “My job feels like it fits me,” “I feel success in the work I do,” and “I feel disconnected from those around me,” with reverse scoring where appropriate (1 = strongly disagree to 5 = strongly agree). Reliability was $\alpha = .89$.

Consistent with the broader measurement approach, we selected two items per need to reduce survey length and maximize participation across a large trainee sample. Internal consistency estimates in the current study were strong, supporting the adequacy of these abbreviated measures for capturing core constructs.

Motivational quality

We assessed motivational quality using a brief, theory-aligned item set, capturing residents’ position along the SDT continuum, from amotivation to controlled to autonomous motivation. Ten items (two per regulation) measured amotivation, external-, introjected-, and identified/integrated regulation, and intrinsic motivation, on a 1-5 scale. Consistent with prior SDT research, we calculated a relative autonomy index by applying differential weights to each regulation type and rescaling the resulting score such that higher values reflected more self-determined motivation. Reliability was $\alpha = .88$.

Well-being indicators

To reduce the number of outcomes in the path model while capturing overall functioning, we created a composite well-being score by averaging standardized scores for professional fulfillment, organizational pride, and vitality. Internal consistency for the composite was $\alpha = .87$.

We measured professional fulfillment using the 6-item Professional Fulfillment Index (0 = not at all true to 4 = completely true), including items such as

“I feel worthwhile at work” and “My work is meaningful to me.” Reliability was $\alpha = .94$. We assessed pride in hospital using two items (e.g., “I am proud of what my hospital stands for,” $r = .91$). We measured vitality with four items assessing positive energy and initiative at work (1-5 scale; $\alpha = .91$), such as “I have a lot of positive energy and initiative” and “I feel drained” (reversed).

Ill-being indicators

We operationalized ill-being using indicators of exhaustion, disengagement, and stress, reflecting established dimensions of burnout and distress. We assessed exhaustion with the Professional Fulfillment Index exhaustion subscale (0-4 scale; $\alpha = .87$). We measured interpersonal disengagement with six items assessing loss of empathy or connectedness with colleagues or patients ($\alpha = .94$) and stress with two items assessing perceived work stress frequency ($r = .65$). We created a composite ill-being score by averaging standardized scores across these three indicators to represent a broader maladaptive functioning construct ($\alpha = .80$).

Data analysis

We first calculated descriptive statistics and internal consistency estimates for all measures. We used Pearson correlations to examine bivariate associations among ASL, need satisfaction, motivational quality, and well-being/ill-being. We then specified a path model based on SDT. We specified the model a priori based on theory rather than exploratory associations, modeling perceived ASL as an antecedent of need satisfaction and motivational quality, and need satisfaction and motivational quality as predictors of well-being and ill-being. We selected path analysis because it allowed us to test the plausibility of this multistep motivational sequence and estimate direct and indirect associations simultaneously within a single model.

We standardized all variables prior to analysis and assessed model fit using Chi-square (χ^2), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean

Square Residual (SRMR), using conventional cut-points to guide interpretation. We tested indirect associations using 10,000 bootstrap samples with 95% confidence intervals and conducted all analyses in R (version 4.3).

Because the study included a modest response rate and a sample of 278 respondents, findings should be interpreted as theory-consistent associations rather than definitive estimates of population effects. However, the final sample exceeded common minimum recommendations for a path model of this complexity and was considered adequate for the planned analysis (a priori power analysis using G*Power, assuming a moderate standardized effect size [$\beta = .25$]).

Results

Participant characteristics

A total of 319 out of 1,651 eligible trainees initiated the survey (19.3%). After removal of respondents who failed data-quality checks, the final analytic sample consisted of 278 trainees, corresponding to an overall response rate of 16.8%. Respondents represented 11 specialties, most commonly from internal medicine (40.6%) and family medicine (21.2%), with smaller proportions from psychiatry, emergency medicine, surgery, obstetrics and gynecology, and other programs. Because some specialty groups were small, the analyses focused on overall motivational processes across the sample rather than specialty-specific comparisons.

Descriptive statistics

Residents reported moderately favourable perceptions of autonomy-supportive leadership ($M = 3.95$, $SD = 0.83$), psychological need satisfaction ($M = 3.78$, $SD = 0.87$), and motivational quality ($M = 3.83$, $SD = 0.77$). We present descriptive statistics for all study variables in Appendix B, Table B1.

Correlations among variables

Consistent with the study hypotheses, perceived ASL was positively associated with both need satisfaction and motivational quality and negatively associated with ill-being. Need satisfaction and motivational quality were, in turn, positively associated with well-being and negatively associated with ill-being (Appendix A, Table A1; Appendix B, Table B2).

A one-way ANOVA showed statistically significant but modest differences in stress across specialties ($F(10, 265) = 4.64, p < .001, \eta^2 = .15$). However, given small cell sizes in several specialty groups and the study's theory-driven focus on general motivational processes rather than specialty effects, specialty was not included in the primary path model.

As shown in Figure 1, higher perceived ASL predicted greater psychological need satisfaction ($\beta = .74, p < .001$). In turn, need satisfaction predicted higher motivational quality ($\beta = .72, p < .001$). Both need satisfaction and motivational quality were associated with higher well-being ($\beta = .52$ and $\beta = .44$, respectively) and lower ill-being ($\beta = -.51$ and $\beta = -.34$, respectively).

Bootstrapped indirect effects supported the hypothesized SDT pathway: ASL showed significant indirect associations with both well-being and ill-being through psychological need satisfaction and motivational quality. Overall, the model explained 46% of the variance in well-being and 35% of that in ill-being. We present the full model coefficients in Appendix B, Table B3.

Path model testing the SDT framework

We tested a path model reflecting the hypothesized SDT sequence: ASL $\rightarrow$ need satisfaction $\rightarrow$ motivational quality $\rightarrow$ well-being and ill-being. Model fit was excellent: $\chi^2(3) = 2.04, p = .56$; CFI = 1.00; RMSEA < .001; SRMR = .013.

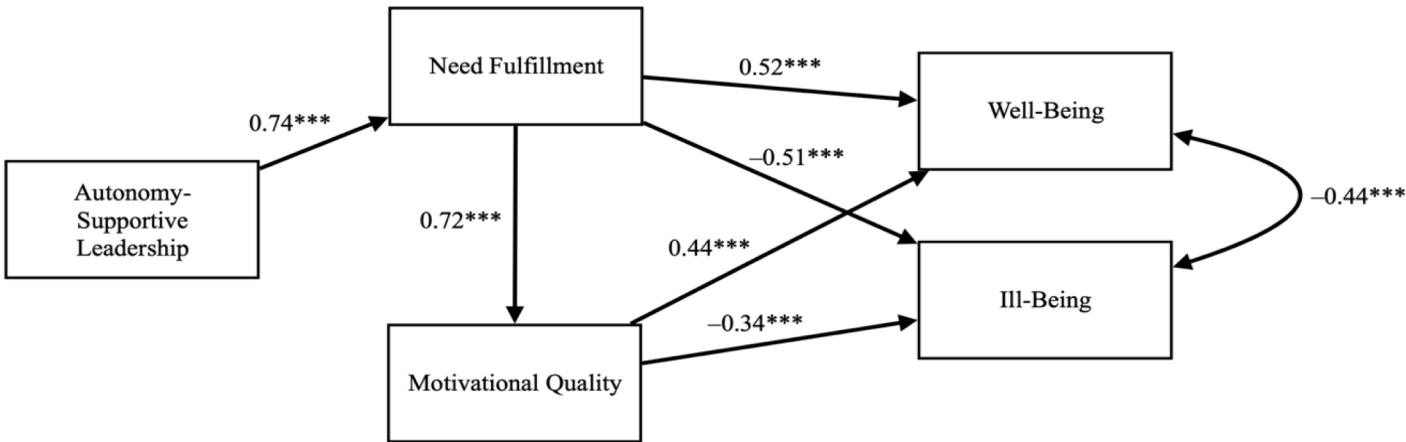


Figure 1. Path model depicting effects of the learning/work environment on residents' need fulfillment, motivational quality, well-being, and ill-being.

***Values represent standardized path coefficients at $p < .001$ significance level.

Discussion

In this cross-sectional study of residents and fellows across multiple hospitals within a single GME system, residents who perceived more autonomy-supportive leadership from attending physicians also reported greater psychological need satisfaction, more self-determined motivation, greater well-being, and lower ill-being. These findings provide integrated, context-specific support for the hypothesized SDT pathway, suggesting that day-to-day supervisory behaviour may be meaningfully related to how residents experience their work and training.

How ASL may function as a mechanism for resident wellness

SDT proposes that high-quality leadership supports wellness not by simply encouraging trainees to “work harder” or “be more resilient,” but by shaping the conditions that make sustained engagement possible. When attending physicians acknowledge residents’ perspectives, offer meaningful rationales, and provide structure without coercion, they may support residents’ needs for autonomy, competence, and relatedness.^{16,17,18} In turn, such conditions are expected to foster more autonomous forms of motivation, which are associated with greater vitality, engagement, and persistence under stress.²²

Our findings were consistent with this mechanism. Residents who perceived more ASL also reported greater need satisfaction and more self-determined motivation, and these variables were, in turn, associated with both higher well-being and lower ill-being. This pattern supports the value of viewing resident wellness not only as an outcome of individual coping capacity, but also as something shaped by the relational and motivational features of the training environment.

Relation to prior SDT and GME research

The present results extend a robust SDT literature from undergraduate medical education, where autonomy-supportive teaching has repeatedly been

linked to improved learning, motivation, and well-being.^{11,23} Existing SDT research in residency has been more limited and has often relied on single-site studies or designs not intended to test the full sequence of leadership, needs, motivation, and wellness outcomes.^{24,16,17,18} By modeling these variables together, our study adds empirical support for the relevance of SDT processes in residency training and suggests continuity in motivational principles across the undergraduate-to-graduate medical education continuum.

Implications for residency training and leadership

A key practical implication is that ASL is potentially modifiable. Unlike structural changes that may require substantial institutional investment, autonomy-supportive behaviours can be integrated into routine supervisory interactions and faculty development. Relevant strategies include perspective-taking and voice, providing meaningful rationales, offering clear and noncontrolling structure, and maintaining a respectful interpersonal tone.

These findings do not suggest that leadership behaviours alone are sufficient to address burnout, nor do they negate the importance of structural contributors such as workload, workflow inefficiencies, scheduling, and administrative burden. Rather, they suggest that supervisory style may represent one actionable and theory-informed leverage point within a broader systems approach to resident well-being. Residency programs may therefore benefit from embedding ASL principles into clinical teaching workshops, coaching and feedback practices, and local learning climate improvement efforts. This may be particularly relevant in contemporary GME/PGME contexts, where calls to better support resident well-being increasingly emphasize training environments and supervision, though often without explicit theoretical grounding.

Strengths and limitations

This study's strengths include its explicit grounding in SDT, use of validated measures, and sampling across multiple hospitals and specialties within one GME system. The study also tested a theoretically specified path model rather than a set of disconnected bivariate relationships, allowing a more integrated examination of the proposed motivational process.

The study also has limitations. The response rate, while not unusual for large trainee surveys, raises the possibility of non-response bias. The cross-sectional design precludes causal inference. All variables were self-reported and may thus reflect shared-method variance. Also, the sample included multiple hospitals and specialties, but all sites were located within the same broader healthcare system, potentially limiting generalizability.

Future directions

Building on these findings, future research should test whether interventions designed to strengthen autonomy-supportive supervision lead to measurable improvements in resident need satisfaction, motivational quality, and well-being over time. Additional work should examine how these processes intersect with structural features of training, including workload, workflow design, and assessment systems. Expanding this line of inquiry across multiple institutions would help clarify the generalizability of the present findings and strengthen the evidence base for SDT-informed leadership development in GME.

Conclusion

Residents occupy a uniquely demanding position within healthcare, balancing high responsibility with ongoing learning and evaluation. In this single-system, multi-site study, residents who perceived more autonomy-supportive leadership also reported a more adaptive motivational profile and better well-being. These findings support autonomy-supportive leadership as a plausible and poten-

tially modifiable target for faculty development and learning climate improvement, while reinforcing the need for longitudinal and multi-institutional research to further establish causal pathways and generalizability.

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Conflict of Interest:

C.R.D., C.S.R., and R.M.R. are affiliated with Immersyve Inc., an organization with a professional interest in the application of SDT. G.G. is affiliated with HCA Healthcare, which may also have an institutional interest in research outcomes related to SDT in healthcare settings. These affiliations may be perceived as potential conflicts of interest. Data collection, analysis, and interpretation were conducted internally at HCA Healthcare. A.N. and J.T.S. are affiliated with academic institutions and report no conflicts of interest related to this research. No external funding influenced the study design, data analysis, interpretation, or the decision to publish.

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Appendices

Appendix A. Survey & scoring details

Table A1. Scale provenance, example items, and internal consistency

Construct (abbrev.)	# Items	Response format	Example item(s)	α (current study)	Original citation
Autonomy-supportive leadership (ASL)	6 (2 per need)	1 = strongly disagree to 5 = strongly agree	“My attendings listen to my opinions.” “My attendings respect me.”	.89	Immersyve custom (see §A3)
Basic psychological need satisfaction (BPNS)	6 (2 per need)	1-5	“I feel success in the work I do.” “My job fits who I am.”	.89	Van den Broeck et al., 2010
Motivational quality (RAI)	10 (2 per regulation)	1-5	“I’m not that motivated for my job” (amotivation) “I do my job only for the paycheck.” (external) “I do my tasks at work mainly out of obligation.” (introjected) “I do my job because I personally value what I do.” (identified) “I do my job because I love what I do.” (intrinsic)	.88	Ryan & Connell, 1989
Professional fulfillment (PF)	6	0 = not at all true to 4 = completely true	“My work is meaningful to me.”	.94	Trockel et al., 2018
Pride in hospital (PIH)	2	1-5	“I am proud of what my hospital stands for.”	.91	Study-specific items
Vitality (VIT)	4	1-5	“I have a lot of positive energy and initiative.”	.91	Ryan & Frederick, 1997
Work exhaustion (WE)	4	1-5	“A sense of dread when I think about the work I have to do.”	.87	Trockel et al., 2018
Interpersonal disengagement (ID)	6	0-4	“Less connected with my colleagues.”	.94	Trockel et al., 2018
Stress (STR)	2	1 = never to 5 = always	“How often do you find your work stressful?”	.65	Study-specific items

§A2. Composite and scoring rules

Relative Autonomy Index (RAI). Each sub-scale mean was centred on 1–5, then weighted -3 (amotivation), -2 (external), -1 (introjected), $+2$ (identified/integrated), $+2$ (intrinsic). Weighted means were averaged and rescaled to 1–5; higher scores reflect more self-determined motivation.

Well-being composite. Mean of PF, PIH, VIT (after rescaling PIH and VIT to 0–4). Internal consistency = .87.

Ill-being composite. Mean of WE, ID, STR (after rescaling STR to 0–4). Internal consistency = .80. All other constructs were unit-weighted means of their respective items. §A3. Proprietary Autonomy-Supportive Leadership and Psychological Need items

The six ASL and six needs-based items were developed by Immersyve, Inc. in collaboration with SDT scholars to map directly onto the autonomy, competence, and relatedness needs in clinical supervision. Because the item wording is commercial intellectual property, the full list is not reproduced here; however, two sample items are provided in Table A1, and the complete scale can be made available to editors or bona-fide researchers under a non-disclosure agreement upon request to the corresponding author.

Appendix B. Statistical supplements

Table B1. Descriptives for raw (un-bolded) and composite (bolded) study variables

Variable	M	SD	Min	Max
Autonomy-Supportive Leadership	3.95	0.83	1.00	5.00
Need Fulfillment	3.78	0.87	1.17	5.00
Motivational Quality	3.83	0.77	1.00	5.00
Amotivation	2.10	1.02	1.00	5.00
External Regulation	2.42	0.98	1.00	5.00
Introjected Regulation	2.49	1.00	1.00	5.00
Identified/Integrated Regulation	4.19	0.78	1.00	5.00
Intrinsic Regulation	3.77	0.96	1.00	5.00
Well-Being	0.00	0.90	-2.46	1.42
Professional Fulfillment	2.97	0.92	0.00	4.00
Vitality	3.29	1.07	1.00	5.00
Hospital Pride	3.27	1.12	1.00	5.00
Ill-Being	0.00	0.85	-1.60	2.36
Workplace Exhaustion	1.65	1.12	0.00	4.00
Interpersonal Disengagement	1.02	0.96	0.00	4.00
Stress	3.18	0.97	1.00	5.00

M, mean; SD, standard deviation; Min, minimum score; Max, maximum score.

Table B2. Pearson correlations between main study variables

Variable	1	2	3	4	5
1. Autonomy-Supportive Leadership	—				
2. Need Fulfillment	.74*	—			
3. Motivational Quality	.50*	.72*	—		
4. Well-Being	.60*	.84*	.82*	—	
5. Ill-Being	-.53*	-.75*	-.70*	-.82*	—

**statistical significance at $p < .001$ level.*

Table B3. Direct, indirect, and total effects

Path	Standardized Estimate	Unstandardized Estimate	Standard Error	Z Value	Bias-corrected 95% CI
Direct Effects					
Autonomy-Supportive Leadership → Need Fulfillment	.74	.78	.04	17.85***	.687, .796
Need Fulfillment → Motivational Quality	.72	.64	.05	14.06***	.645, .792
Motivational Quality → Well-Being	.44	.51	.05	9.92***	.351, .531
Motivational Quality → Ill-Being	-.34	-.37	.06	-6.25***	-.442, -.237
Need Fulfillment → Well-Being	.52	.54	.05	11.92***	.441, .607
Need Fulfillment → Ill-Being	-.51	-.49	.05	-9.33***	-.609, -.407
Indirect Effects					
Need Fulfillment → Motivational Quality → Well-Being	.32	.33	.04	9.10***	.249, .385
Need Fulfillment → Motivational Quality → Ill-Being	-.24	-.24	.04	-6.58***	-.316, -.171
Total Effects					
Well-Being	.84	.87	.02	40.52***	.800, .881
Ill-Being	-.75	-.73	.03	-24.87***	-.811, -.693

Note: CI = confidence interval. *** $p < .001$.