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Residency Program Directors' Perspectives on Overtime Duty Hours and Professional Development Time in Japan

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Purpose: This study aimed to explore the perspectives of residency program directors in Japan regarding overtime duty hours and the balance between clinical training and self-improvement activities. This study explores the impact of work-hour regulations on resident well-being and training quality, contributing to global discourse on medical education reform.

Participants and Methods: A cross-sectional survey was distributed to 701 residency training hospitals across Japan to investigate their readiness for new duty-hour limits under the Medical Care Act, which categorizes working hours into Level A (960 hours/year), Level B (1440 hours/year), and Level C-1 (1920 hours/year). The survey, conducted from October 18 to December 15, 2023, achieved a 36.2% response rate (n=254). Key questions included: "Considering the balance between clinical skills development and mental well-being, what do you think is the optimal number of overtime duty hours per month for resident physicians?" Statistical analysis included descriptive statistics and Chi-square tests to compare responses across hospital types.

Results: Most directors favored a conservative overtime limit of 40 hours per month (mean ± standard deviation: 40 ± 21 h), with 24.0% expressing this preference. These findings reveal a significant evidence-practice gap, suggesting that current practices often exceed recommended limits, highlighting a need for alignment between policy and implementation.

Conclusion: This study provides insights into the complex interplay between resident training demands and well-being under Japan's new duty-hour reforms. It offers valuable insights for policymakers and educators aiming to optimize training environments and enhance resident well-being globally.

Keywords: duty hours, program director, professional development, residency, work style reform, fatigue management

Introduction

In response to growing concerns over physicians' burnout and the need to improve their work-life balance,[1] Japan began implementing comprehensive workstyle reforms for physicians in April 2024.[2] These reforms are a critical pivot from traditional practices, mandating a reduction in physicians' overtime duty hours. In Japanese residency training, "self-improvement time" refers to activities that enhance a resident's clinical knowledge and skills, such as independent study, research activities, and educational seminars. While these are crucial for professional development, such activities often occur outside formal duty hours. The Medical Care Act in Japan categorizes working hours into different levels based on annual overtime limits. Level A limits overtime to under 960 hours per year, averaging 80 hours per month. Level

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B offers a more lenient limit, while Level C-1 extends the cap to under 1920 hours per year, equating to 160 hours per month.[3] These categorizations help structure and regulate the work-life balance of resident physicians.

Research has shown that excessive overtime hours are linked to increased burnout, decreased mental health, and reduced patient safety.[4–6] Furthermore, studies have demonstrated that reducing duty hours improves residents' mental health and clinical performance. Evidence-based recommendations suggest that limiting duty hours to 80–100 hours per month can optimize educational outcomes, personal well-being, and patient safety.[4–6] However, the optimal balance between adequate clinical training and resident well-being remains underexplored, particularly within Japan's unique medical training environment. The concept of "self-improvement time", unique to Japan's residency programs, is central to this study. By exploring how program directors classify and integrate such activities into formal duty hours, this research provides insights into optimizing resident training while prioritizing their well-being.

Historically, work-hour regulations for physicians in Japan could be considered to be lax, allowing for extended working hours that often led to resident burnout, mental health issues, and potential compromises in patient safety.[4–6] Key milestones in addressing these challenges began in the early 2000s, with increased awareness of the negative impacts of excessive work hours.[7] Despite these concerns, reforms remained limited in scope until the recent push in 2024 to implement stricter nationwide regulations. These policy changes reflect a growing recognition of the need for a sustainable work environment for resident physicians while balancing the demands of comprehensive clinical training.[7]

When comparing Japan's work-hour reforms with those in other countries, notable differences and lessons emerge. For instance, the United States implemented duty-hour restrictions for resident physicians in 2003, limiting weekly work hours to 80 hours, which has since been refined to balance training and physician well-being.[7,8] Similarly, European countries adopted the European Working Time Directive in 2009, capping weekly work hours at 48.[9] While these initiatives share a common goal with Japan's reforms, differences in healthcare systems, cultural attitudes towards work, and training structures present unique challenges. Japan's reforms must consider these differences while learning from the successes and setbacks of international efforts to ensure effective implementation.

Despite the recommendations to limit duty hours, there remains an "evidence-practice gap", as current practices often exceed the suggested limits. This gap highlights the complexity of delineating duty hours and professional development activities within the clinical training environment,[10] risking overburdening residents or limiting clinical exposure, potentially impacting long-term competency and patient care quality.[11] Historical benchmarks of optimal working hours derived from prior research suggest that 60–65 weekly duty hours or 80–100 monthly overtime hours strike a balance that benefits resident physicians' educational outcomes, personal well-being, and patient safety. However, enforcing these benchmarks within Japan's current medical training framework remains a challenge.

This study aimed to explore the perspectives of residency program directors regarding the impending reforms to determine their views on ideal overtime duty hours that balance training efficacy and resident well-being. The hypothesis guiding this research is that residency program directors will support a reduction in overtime hours that aligns more closely with evidence-based recommendations while maintaining the quality of clinical training. This study examines program directors' perspectives to assess how recent reforms may impact the clinical environment and shape future policies on resident work hours in Japan. These findings hold relevance for countries with similar hierarchical medical training systems, such as South Korea, China, and Germany, where cultural and systemic factors similarly shape duty-hour policies and resident well-being. Furthermore, this study offers a transferable framework for evaluating and improving residency training conditions globally, particularly in systems shaped by hierarchical structures and cultural expectations.

Materials and Methods

To understand the potential impact of Japan's work style reforms on the training environment of resident physicians, we conducted a descriptive, cross-sectional survey. The study employed purposive sampling, targeting hospitals participating in the 2023 General Medicine In-Training Examination (GM-ITE). These hospitals were chosen for their focus on structured training and evaluation systems, aligning with the study's objectives. While this ensured the inclusion of key stakeholders in structured residency environments, it may limit generalizability to non-participating hospitals. The sample size was not predetermined, as all GM-ITE participating residency training hospitals were included. While no

formal sample size calculation was conducted, including all eligible institutions participating in the GM-ITE enabled a comprehensive collection of program directors' perspectives. This approach ensured the breadth of data necessary to draw meaningful insights, albeit with the acknowledged limitation of potential selection bias due to voluntary participation in the GM-ITE.

The target population for our survey comprised program directors at 701 residency training hospitals, all of whom had applied to participate in the 2023 General Medicine In-Training Examination (GM-ITE), a benchmark assessment in which approximately half of all Japanese resident physicians participate annually.[4–6] Inclusion criteria included all residency training hospitals participating in the 2023 GM-ITE, ensuring the sample represented institutions prioritizing structured training and assessment frameworks. Hospitals not participating in the GM-ITE were excluded. The GM-ITE assesses the clinical competencies of residents and is a key evaluation tool for training programs. Participation is voluntary, which may introduce selection bias, as hospitals participating in the exam may emphasize structured training and evaluation more than non-participating hospitals. Prior to conducting the survey, we obtained approval from the Ethics Review Board of the Japan Institute for Advancement of Medical Education Program to ensure the research's ethical integrity.

Our survey was conducted from October 18 to December 15, 2023. It was designed to extract nuanced insights into these facilities' operational plans and preparedness in anticipation of new duty-hour regulations.

Survey Instrument

The survey, developed by a team of medical education experts, was distributed via Email to program directors, allowing self-completion at their convenience. Designed and administered in Japanese, the native language of all participants, no translation was necessary as all respondents were program directors at Japanese hospitals. Each Email included a detailed explanation of the study's purpose and self-completion instructions. Respondents were assured of voluntary participation and anonymity to foster candid feedback. Follow-up emails were sent to non-responding institutions to maximize participation. The questionnaire was reviewed for content validity by the expert team, though quantitative validation processes, such as reliability testing, were not conducted. Future studies should consider psychometric evaluations to improve reliability. The survey included both multiple-choice and open-ended questions. One of the primary questions was, "Considering the balance between the development of clinical skills and mental well-being, what do you think is the optimal number of overtime duty hours per month for resident physicians?" The response options for this question ranged from 0 to over 100 hours per month, which were categorized into eight distinct categories: C1 (0 hours) to C8 (≥100 hours) (Figure 1).[3,4] This categorization facilitated a granular analysis of the current spectrum of duty hours and the anticipated changes post-reform.[3,4]

Category	C1	C2	C3	C4	C5	C6	C7	C8
Duty hour per week	<45	45 to <50	50 to <55	55 to <60	60 to <65	65 to <70	70 to <80	≥80
Overtime duty hour per month	<20	20 to <40	40 to <60	60 to <80	80 to <100	100 to <120	120 to <160	≥160
Overtime duty hour per year	<240	240 to <480	480 to <720	720 to <960	960 to <1200	1200 to <1440	1440 to <1920	≥1920

Figure 1 Categories of physicians' duty hours.

Categorization of Activities

To explore program directors' perspectives on what constitutes "working hours" versus "self-improvement" activities, the survey included a question that listed various activities (eg, patient procedures, mandatory study groups, conferences, and independent research) with multiple selection options. Program directors were asked, "Which activities do you consider as working hours rather than self-study (multiple selections allowed)?" The responses helped us understand how directors classify different duties. We categorized activities as "working hours" based on their frequency and perceived necessity for clinical practice, while activities for personal academic enrichment were classified as "self-improvement". However, the subjective nature of these classifications was acknowledged, and this potential bias was considered in the analysis. Participants were assured of anonymity to encourage honest responses and alleviate concerns about identification.

Statistical Analysis

Data analysis used descriptive statistics, including frequency and percentages for categorical variables. We performed Chi-square tests to explore relationships between variables and compare program directors' preferences across different hospital types (community vs university hospitals). A p-value of <0.05 was considered statistically significant. All statistical analyses were performed using SPSS software (version 26, IBM Corp., Armonk, NY). Survey responses were anonymized before analysis to maintain participant confidentiality and ensure unbiased data handling.

Results

Responses were received from 254 (233 community hospitals, 21 university hospitals) of the 701 surveyed facilities (response rate: 36.2%). Following the implementation of new regulations for resident physicians' overtime duty hours, most surveyed medical institutions (83.5%) considered adopting Level A (under 960 hours per year). Most directors preferred a conservative overtime limit of 40 hours per month (mean ± standard deviation: 40 ± 21 h), with 24.0% expressing this preference. There was a notable preference for 40 hours per month, with 22.3% of community hospital directors and 42.8% of university hospital directors expressing this as the ideal limit (Table 1). Results indicated a statistically significant preference for shorter overtime limits among university hospitals ($p < 0.05$).

A more detailed breakdown of the institutions revealed that 32.7% fell into Category C2 (20 to <40 hours of overtime per month) and 31.5% into Category C3 (40 to <60 hours per month), indicating a divergence between current practices and policy recommendations. These findings underscore a discrepancy between the preferred overtime hours among program directors and previous evidence-based recommendations.

In terms of activity classification, most program directors identified patient procedures, mandatory study groups, and conferences as part of "working hours" rather than "professional development" activities (Figure 2). Specifically, 95.4% of respondents classified patient procedures as working hours, while 87.7% classified compulsory study groups and conferences similarly. Additionally, 69.7% allocated time for preparing conference presentations as directed by supervising physicians, contrasting with the minimal emphasis on independent studies (2.7%). This distinction indicates the complex nature of delineating between activities that are considered part of formal duty hours versus those for self-improvement.

Moreover, 65.4% of the institutions reported frequently or occasionally encouraging resident physicians to return home early to reduce overtime duties. This suggests an institutional awareness of the importance of managing residents' work hours to promote their well-being, though it also raises questions about the potential underreporting of actual work hours and its impact on training quality.

Discussion

Contribution to the Field

This study provides novel insights into the perspectives of residency program directors in Japan on impending work-hour reforms. Unlike prior research on optimal duty hours, it examines the attitudes and anticipated challenges of those tasked with implementation. The discrepancy between directors' preferred overtime hours and existing recommendations underscores the potential impact of the reforms and highlights the need for further policy adjustment.

Table 1 Optimal Monthly Overtime Duty Hours for Resident Physicians by Resident Program Directors

Overtime Duty Hours per Month	**None**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**≥100**
Category	C1		C2		C3		C4		C5		
Total (n, %)	9 (3.5)	15 (5.9)	43 (16.9)	40 (15.8)	61 (24.0)	19 (7.5)	36 (14.2)	12 (4.7)	15 (5.9)	2 (0.8)	2 (0.8)
Community hospital (n, %)	6 (2.6)	13 (5.6)	42 (18.0)	38 (16.3)	52 (22.3)	19 (8.1)	35 (15.0)	11 (4.7)	13 (5.6)	2 (0.9)	2 (0.9)
University hospital (n, %)	3 (14.3)	2 (9.5)	1 (4.8)	2 (9.5)	9 (42.8)	0 (0)	1 (4.8)	1 (4.8)	2 (9.5)	0 (0)	0 (0)

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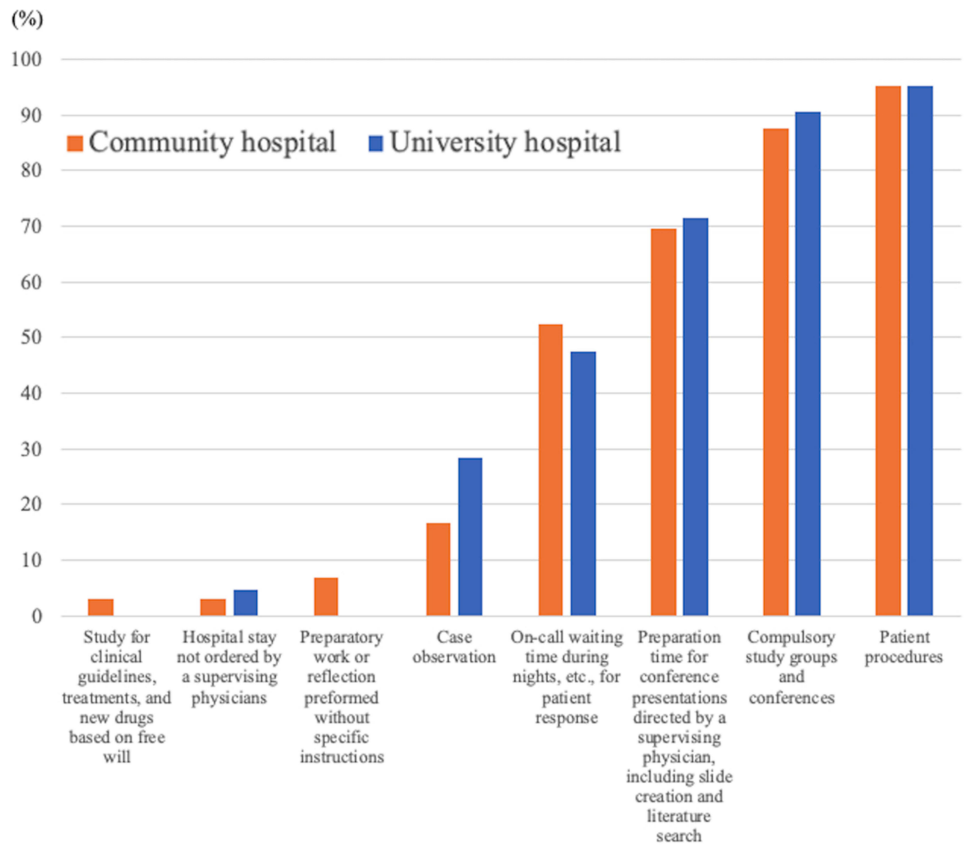

Figure 2 Program directors' perspectives on what constitutes "working hours" versus "self-improvement" activities.

General Discussion

Previous studies have recommended 80 h to 100 h overtime duty per month (C5) for resident physicians.[4–6] Our survey found that residency program directors preferred an overtime limit of 40 h per month (C3), highlighting an evidence-practice gap. This conservative shift is influenced by anticipated reforms and stricter enforcement. The preference for a lower overtime limit may also reflect a growing awareness of the adverse effects of excessive working hours on resident well-being.[6,7,11–13] Burnout, mental health issues, and physical exhaustion are well-documented consequences of long working hours, which not only affect the personal health of residents but also compromise patient safety and the overall quality of care.[5,7,12,13] Moreover, program directors may increasingly recognize the importance of work-life balance in fostering a more sustainable and productive workforce.[14,15] Therefore, the preference for shorter working hours could signal a shift towards a more resident-centered approach to medical training.

Moreover, recognizing patient procedures and mandatory educational activities as duty hours instead of professional development time underscores the complexity of delineating educational activity limits.[14–16] This distinction is critical because it affects how resident physicians allocate their time between direct patient care, essential for their clinical training, and academic activities integral to their professional development.[17,18] The fact that many directors classified study groups, patient care conferences, and preparation for presentations as duty hours rather than personal study time indicates that these activities are increasingly being viewed as part of the formal educational curriculum rather than as extracurricular endeavors.[19,20] This shift suggests redefining the boundaries between working hours and professional development in residency training, which may lead to a more structured and supportive learning environment.[21,22]

The study had a 36.4% response rate and did not cover all 1037 Japanese clinical training hospitals, which may limit its generalizability. Furthermore, as a limitation, this study's results might have been affected by selection bias, as hospitals participating in the GM-ITE may differ from non-participants. For example, hospitals emphasizing structured training and evaluation might be more inclined to participate in the GM-ITE, potentially skewing the survey results

toward a certain perspective of on-duty hours. The focus on GM-ITE-participating institutions introduces selection bias, limiting the generalizability of our findings. These institutions may prioritize structured training environments more than non-participating facilities, potentially skewing results toward a reform-ready perspective. Nonetheless, the insights provide valuable guidance for structured training environments. Future studies should encompass a broader range of training hospitals to enhance representativeness. In addition, the self-reported nature of the survey responses introduces the possibility of response bias.[23] Program directors may have provided answers that reflect more idealized or aspirational views of their institutions' compliance with duty-hour reforms rather than actual practice. This could result in an overestimation of readiness to comply with the new regulations or an underreporting of current overtime practices. Future studies could triangulate self-reported data with objective measures, such as actual duty-hour logs or resident self-reports, to better understand working conditions.

Another important point to consider is the impact of these reforms on the quality of residency training.[24] While reducing overtime hours may mitigate the risk of burnout and improve work-life balance, there is concern that such limitations could compromise the depth of clinical exposure and hands-on experience that residents need to develop competency in their specialties. Studies from other countries, such as the United States and Europe, have shown mixed results regarding the impact of duty-hour limitations on clinical competency.[25,26] Some evidence suggests that reduced hours do not necessarily translate into poorer outcomes, as more focused and efficient learning can compensate for reduced time.[5] However, Japan's unique healthcare system and medical training culture may present different challenges, and further research is needed to assess these reforms' long-term effects on resident competency and patient care quality.

Implications

This study provides actionable insights for policymakers, educators, and training institutions to enhance residency training programs under the new duty-hour regulations. Implementing these evidence-based recommendations can help balance resident well-being with the need for robust clinical training.

For Policymakers

To effectively implement duty-hour reforms, clear guidelines must be established to distinguish between working hours and self-improvement activities.[27] This clarification would standardize institutional practices and ensure compliance. Policies should promote structured training models that optimize educational outcomes within restricted duty hours. Engaging residency program directors and residents in policy development can help align regulations with practical needs.[28]

For Training Institutions

Residency programs should align with reforms while maintaining training quality.[29] Structured schedules incorporating self-improvement activities into formal training hours could help residents balance clinical and academic responsibilities. Time management and prioritization training would further enable effective use of limited duty hours without hindering professional development.[30] Institutions must foster a supportive culture that emphasizes resident well-being, open communication about work-life balance, and addressing burnout concerns.[31] Regular assessments of duty-hour practices, with resident input, can ensure compliance and identify areas for improvement.

Broader Research and Policy Directions

Future research should evaluate the long-term effects of duty-hour reforms on resident competencies and patient care quality. Incorporating diverse hospital types, including non-GM-ITE participants, would enhance representativeness. Triangulating self-reported data with objective metrics, such as work logs or resident feedback, could strengthen reliability. Moreover, this study's insights could guide duty-hour policy reforms in other nations with hierarchical medical training systems. These recommendations offer a transferable framework for improving residency conditions globally, addressing cultural and systemic nuances.

Conclusion

Many residency training hospitals have implemented Level A limits for duty hours; however, our study reveals that residency program directors generally favor even shorter limits, such as 40 hours per month, to enhance the support for resident well-being. This preference underscores the need to bridge the gap between policy, practice, and evidence-based recommendations to create a more resident-centered training environment.

Developing strategies that maintain high-quality clinical training while safeguarding resident physicians' health is essential to implement these reforms successfully. This may include providing clearer guidelines on classifying working hours versus self-improvement activities, offering structured educational programs that effectively use limited duty hours, and promoting flexible training models that adapt to various clinical settings. Additionally, fostering collaboration between policymakers, training institutions, and residents is crucial to ensure the reforms achieve their goals without compromising educational outcomes or patient care quality.

Ongoing research and evaluation are needed to monitor the long-term effects of these duty-hour regulations on resident well-being, competency development, and healthcare delivery. By taking a holistic and evidence-based approach, Japan's medical education system can move towards creating a sustainable and supportive environment for its future physicians, enhancing the quality of patient care. Although the findings provide valuable insights, they should be interpreted cautiously due to the study's focus on GM-ITE-participating institutions. Policymakers and educators should consider these results as a framework for future studies and implementation research, which will help them validate and expand upon these findings in the context of diverse training environments.

Data Sharing Statement

Data from the GM-ITE can be made available to researchers with ethical permission to access that data for specified purposes.

Ethics Approval and Informed Consent

This study was approved by the Ethics Review Board of the Japan Institute for the Advancement of Medical Education Program (23-33). All participants provided written informed consent.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work. YN is equally contributed to the corresponding author.

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Disclosure

KS received an honorarium from JAMEP as a speaker for the JAMEP lecture and as an exam preparer for the GM-ITE. YN received an honorarium from the JAMEP as a GM-ITE project manager. YT is the director of the JAMEP and has

received an honorarium from the JAMEP as a speaker for the JAMEP lecture. HK received an honorarium from the JAMEP as a speaker for the JAMEP lecture. TS received an honorarium from the JAMEP as an exam preparer for the GM-ITE. The authors report no other conflicts of interest in this work.

References

1. Ministry of Health. Labour and welfare. addressing the reform of the working style of physicians in the clinical training system. Available from: https://www.mhlw.go.jp/content/10803000/000590866.pdf. Accessed July 20, 2024.
2. Ministry of Health. Labour and welfare. overview of the physician's work style reforms. Available from: https://www.mhlw.go.jp/content/10800000/001129457.pdf. Accessed July 20, 2024.
3. Ministry of Health. Labour and welfare. The 10th study group on the promotion of physician's work style reforms. Available from: https://www.mhlw.go.jp/content/10800000/000693035.pdf. Accessed July 20, 2024.
4. Nagasaki K, Nishizaki Y, Shinozaki T, et al. Impact of the resident duty hours on in-training examination score: a nationwide study in Japan. *Med Teach*. 2022;44(4):433–440. doi:10.1080/0142159X.2021.2003764
5. Nagasaki K, Nishizaki Y, Shinozaki T, et al. Association between mental health and duty hours of postgraduate residents in Japan: a nationwide cross-sectional study. *Sci Rep*. 2022;12(1):10626. doi:10.1038/s41598-022-14952-x
6. Nagasaki K, Kobayashi H, Nishizaki Y, et al. Association of sleep quality with duty hours, mental health, and medical errors among Japanese postgraduate residents: a cross-sectional study. *Sci Rep*. 2024;14(1):1481. doi:10.1038/s41598-024-51353-8
7. Wong K, Chan AHS, Ngan SC. The effect of long working hours and overtime on occupational health: a meta-analysis of evidence from 1998 to 2018. *Int J Environ Res Public Health*. 2019;16(12):2102. doi:10.3390/ijerph16122102
8. Philibert I, Chang B, Flynn T, et al. The 2003 common duty hour limits: process, outcome, and lessons learned. *J Grad Med Educ*. 2009;1(2):334–337. doi:10.4300/JGME-D-09-00076.1
9. Wyman MG, Huynh R, Owers C. The European working time directive: will modern surgical training in the United Kingdom be sufficient? *Cureus*. 2022;14(1):e21797. doi:10.7759/cureus.21797
10. Filipe HP, Silva ED, Stulting AA, Golnik KC. Continuing professional development: best practices. *Middle East Afr J Ophthalmol*. 2014;21(2):134–141. doi:10.4103/0974-9233.129760
11. Van Camp JV, Chappy S. The effectiveness of nurse residency programs on retention: a systematic review. *AORN J*. 2017;106(2):128–144. doi:10.1016/j.aorn.2017.06.003
12. Ishikawa M. Overwork among resident physicians: national questionnaire survey results. *BMC Med Educ*. 2022;22(1):729. doi:10.1186/s12909-022-03789-7
13. Nagasaki K, Kobayashi H. The effects of resident work hours on well-being, performance, and education: a review from a Japanese perspective. *J Gen Fam Med*. 2023;24(6):323–331. doi:10.1002/jgf2.649
14. Le AB, Balogun AO, Smith TD. Long work hours, overtime, and worker health impairment: a cross-sectional study among stone, sand, and gravel mine workers. *Int J Environ Res Public Health*. 2022;19(13):7740. doi:10.3390/ijerph19137740
15. West CP, Halvorsen AJ, Swenson SL, McDonald FS. Burnout and distress among internal medicine program directors: results of a national survey. *J Gen Intern Med*. 2013;28(8):1056–1063. doi:10.1007/s11606-013-2349-9
16. Yang S, Chen L, Bi X. Overtime work, job autonomy, and employees' subjective well-being: evidence from China. *Front Public Health*. 2023;11:1077177. doi:10.3389/fpubh.2023.1077177
17. Noordman J, Post B, van Dartel AAM, Slits JMA, Olde Hartman TC. Training residents in patient-centred communication and empathy: evaluation from patients, observers and residents. *BMC Med Educ*. 2019;19(1):128. doi:10.1186/s12909-019-1555-5
18. Vijn TW, Wollersheim H, Faber MJ, Fluit CR, Kremer JA. Building a patient-centered and interprofessional training program with patients, students and care professionals: study protocol of a participatory design and evaluation study. *BMC Health Serv Res*. 2018;18(1):387. doi:10.1186/s12913-018-3200-0
19. Frey SM, Méan M, Garnier A, et al. Inter-hospital comparison of working time allocation among internal medicine residents using time-motion observations: an innovative benchmarking tool. *BMJ Open*. 2020;10(2):e033021. doi:10.1136/bmjopen-2019-033021
20. Bolster L, Rourke L. The effect of restricting residents' duty hours on patient safety, resident well-being, and resident education: an updated systematic review. *J Grad Med Educ*. 2015;7(3):349–363. doi:10.4300/JGME-D-14-00612.1
21. Salgado SM, Katz JT, Pelletier SR, et al. Impact of extended duty hours on perceptions of care and objective patient outcomes. *J Patient Saf*. 2022;18(6):e938–e946. doi:10.1097/PTS.0000000000000988
22. Desai SV, Asch DA, Bellini LM, et al. Education outcomes in a duty-hour flexibility trial in internal medicine. *N Engl J Med*. 2018;378(16):1494–1508. doi:10.1056/NEJMoa1800965
23. Rosenman R, Tennekoon V, Hill LG. Measuring bias in self-reported data. *Int J Behav Healthc Res*. 2011;2(4):320–332. doi:10.1504/IJBHR.2011.043414
24. van der Leeuw RM, Lombarts KM, Arah OA, Heineman MJ. A systematic review of the effects of residency training on patient outcomes. *BMC Med*. 2012;10:65. doi:10.1186/1741-7015-10-65
25. Weiss P, Kryger M, Knauert M. Impact of extended duty hours on medical trainees. *Sleep Health*. 2016;2(4):309–315. doi:10.1016/j.sleh.2016.08.003
26. Antiel RM, Reed DA, Van Arendonk KJ, et al. Effects of duty hour restrictions on core competencies, education, quality of life, and burnout among general surgery interns. *JAMA Surg*. 2013;148(5):448–455. doi:10.1001/jamasurg.2013.1368
27. Jena AB, Schoemaker L, Bhattacharya J. Exposing physicians to reduced residency work hours did not adversely affect patient outcomes after residency. *Health Aff*. 2014;33(10):1832–1840. doi:10.1377/hlthaff.2014.0318
28. Sasnal M, Jensen RM, Mai UT, et al. Strategies to foster stakeholder engagement in residency coaching: a CFIR-informed qualitative study across diverse stakeholder groups. *Med Educ Online*. 2024;29(1):2407656. doi:10.1080/10872981.2024.2407656
29. Clemo R, Parsons AS, Boggan JC, Shieh L, Miller BP. Learning by doing: practical strategies to integrate resident education and quality improvement initiatives. *J Grad Med Educ*. 2021;13(5):631–634. doi:10.4300/JGME-D-21-00381.1

30. Murphy M, Pahwa A, Dietrick B, Shilkofski N, Blatt C. Time management and task prioritization curriculum for pediatric and internal medicine subinternship students. *MedEdportal*. 2022;18:11221. doi:10.15766/mep_2374-8265.11221
31. Ilaria S, Coppola KM, Copeland L, et al. Process groups for supporting resident wellbeing: factors influencing resident wellness amid the COVID-19 pandemic. *Healthcare*. 2024;12(20):2059. doi:10.3390/healthcare12202059