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Medical education on inpatient medical oncology service before and after oncology hospitalist program

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Abstract

Background At Smilow Cancer Hospital, internal medicine-boarded oncology hospitalists assumed primary team attending responsibilities on an adult inpatient medical oncology academic service beginning in 2021. Medical oncology faculty transitioned from primary team attending to consulting physicians but remained engaged in daily morning teaching and twice-weekly formal afternoon didactics. The aim of this study was to compare the educational experiences of internal medicine residents before and after implementation of the oncology hospitalist program.

Methods Yale School of Medicine internal medicine residents receive MedHub surveys following the inpatient oncology rotation. Surveys completed before July 2021 were compared to those after July 2022, when oncology hospitalists were fully integrated into both of the medical oncology teaching services. Surveys asked residents to: (1) score their rotation experience on a 5-point Likert scale (Poor = 1, Good = 2, Very Good = 3, Fair = 4, Excellent = 5) and (2) delineate major positives and negatives noted on their rotation using a free-text field. Answers were compared across timepoints using parametric tests.

Results 118 participants completed the survey pre-implementation, and 84 completed the survey post-implementation. Residents completing the survey post-implementation reported greater general satisfaction ($p = 0.005$), greater balance between education and clinical demands ($p = 0.019$), improved resident education ($p = 0.027$), and greater hospitalist support ($p < 0.001$). There was greater operational challenges post-implementation ($p = 0.003$).

Discussion Previously-published literature has reported oncology hospitalist programs to have good hospital outcomes, with satisfaction and acceptance by oncologists. This article adds to the literature, suggesting that residents also experience improved clinical experience and support as well as a greater balance between clinical and educational demands. Further work can build upon the hospitalist model and explore oncology-specific education and mentorship to supplement the existing educational experience.

Keywords Oncology, Palliative care, Inpatient, Hospitalist, Medical education

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Introduction

Inpatient care within oncology is becoming increasingly specialized, with patients often requiring complex, multi-disciplinary care. Traditionally, medical oncology faculty have served as attendings on inpatient services, balancing both outpatient responsibilities and inpatient care. However, as outpatient oncology care has grown more specialized, there has been a shift toward utilizing dedicated oncology hospitalists to guide inpatient care [1–3], supporting oncologists to focus on outpatient clinical and research obligations. This shift mirrors a broader trend in internal medicine, where hospitalist-led services have been shown to improve efficiency and streamline care coordination in various settings.

Hospitalist-led inpatient services have grown in popularity across multiple specialties. Previous studies have demonstrated that hospitalist models can produce outcomes comparable to those of subspecialist-led services in terms of key metrics such as length of stay, 30-day readmission rates, morbidity, and patient disposition [1–3]. However, while these studies have focused primarily on patient outcomes and acceptance by specialists, there is a significant gap in the literature regarding how these models affect the education of internal medicine residents, particularly within an academic oncology setting.

At Smilow Cancer Hospital, the medical oncology inpatient service is supported by two internal medicine resident-led teaching teams. Historically, medical oncology faculty served as attendings on the service. Beginning in 2021, a new collaboration was established between oncology and hospital medicine, where oncology hospitalist attendings assumed the attending role on one of two teaching teams. By 2022, both teaching teams were staffed exclusively by oncology hospitalists, while medical oncology faculty transitioned fully to a consulting role. This represented a major structural change aimed at enhancing the quality of inpatient care while supporting the educational needs of internal medicine residents.

The introduction of oncology hospitalists presents an opportunity to examine not only the clinical impact of this model but also its effect on resident education. The aim of this study was to review the educational experiences of residents following the implementation of the oncology hospitalist program at Smilow Cancer Hospital.

Methods

Yale School of Medicine internal medicine residents rotating on the medical oncology service receive Med-Hub evaluations following the rotation. All participants provided informed consent to complete the survey. Our team reviewed evaluations completed before (July 2021) and after (July 2022) implementation of the oncology hospitalist program on both teaching teams. The survey asked residents to: (1) score their rotation experience on

a 5-point Likert scale (Poor = 1, Good = 2, Very Good = 3, Fair = 4, Excellent = 5) and (2) delineate major positives and negatives noted on their rotation using a free-text field. All survey respondents were anonymized during data collection (Supplement 1).

Quantitative content analysis was conducted following established methodology [4]. Free-text field answers were reviewed initially for themes, for which categories were generated independently and in-duplicate by four reviewers (HM, JR, NP, SS). These categories were refined into consensus categories through discussion, with additional input from two reviewers (EP, RC). Subsequently, each free-text answer was reviewed independently and in-duplicate by three reviewers (EP, CK, ERZ, HM, JR, NP) and categorized. Any discrepancies were resolved by discussion and consensus. If consensus was not achieved, a fourth reviewer (RC) participated in the discussion to help achieve consensus.

Numerical rating scales were reported descriptively and compared between the two timepoints using Student's t-test. The proportion of answers in a free-text field pertaining to a category was compared between the two timepoints using Z-test for proportions. All tests were two-sided, and type 1 error was set at 0.05. All analyses were conducted using StataBE 18.0. This study was evaluated by Yale University Institutional Review Board and deemed exempt (2000037323), and conducted in accordance to the Declaration of Helsinki.

Results

A total of 118 participants completed the survey pre-implementation and 84 completed the survey post-implementation. Descriptive statistics for the 14 questions involving numerical rating scale are presented in Table 1. Of the 14 questions, 4 had significantly different responses across the two timepoints. Post-implementation, residents reported greater perceived ability to attend morning report lectures (pre-implementation 2.59 mean score vs. post-implementation mean score 3.03, $p = 0.023$) and improved balance of education and clinical demands (pre-implementation mean score 1.18 vs. post-implementation mean score 1.33, $p = 0.019$). There was less satisfaction with overall structure (pre-implementation mean score 3.74 vs. post-implementation mean score 3.14, $p < 0.001$) and social work (pre-implementation mean score = 4.56 vs. post-implementation mean score 4.35, $p = 0.034$). Descriptive statistics for frequency of each answer categorization per question field is presented in Supplement 2.

Positive experiences of oncology hospitalist collaboration

Overall, residents reported greater resident education (20.4% pre-implementation vs. 35.9% post-implementation, $p = 0.027$) and greater hospitalist support (2.9%

Table 1 Numerical rating scales

Question	Pre-Implementation (n=118) Mean (SD)	Post-Implementation (n=84) Mean (SD)	P-value
Summative Rating	3.69 (0.9)	3.44 (1.0)	0.065
Expedited PEC Review	1.93 (0.3)	1.89 (0.3)	0.351
Work Round Satisfaction	4.13 (0.7)	3.98 (0.9)	0.185
Attending Rounds	4.14 (0.8)	3.91 (1.0)	0.071
Ability to Attend Morning Report	2.59 (1.3)	3.03 (1.4)	0.023
Ability to Attend Noon Conference	3.23 (1.3)	3.20 (1.3)	0.872
Overall Satisfaction with Education	3.91 (0.9)	3.73 (1.1)	0.203
Appropriate Balance of Education and Clinical Demands	1.18 (0.4)	1.33 (0.5)	0.019
Overall Structure Satisfaction	3.74 (0.8)	3.14 (1.1)	<0.001
Nursing	4.26 (1.0)	4.33 (0.9)	0.610
Pharmacy	4.71 (0.5)	4.80 (0.5)	0.209
Care Coordination	4.50 (0.8)	4.29 (1.0)	0.820
Social Work	4.56 (0.6)	4.35 (0.8)	0.034
Sufficient Preparatory Information	1.03 (0.2)	1.04 (0.2)	0.727

Note higher scores indicate greater attitude

pre-implementation vs. 21.9% post-implementation, $p < 0.001$). A lower proportion of residents reported

workload satisfaction after implementation (16.5% pre-implementation vs. 4.7% post-implementation, $p = 0.022$) (Fig. 1). With respect to educational experiences, a greater proportion of residents reported positive case-based education (13.3% pre-implementation vs. 30.0% post-implementation), experiential learning (10.0% vs. 35.0%, $p = 0.002$) and interdisciplinary education (3.3% vs. 17.5%, $p = 0.015$) (Fig. 2). With respect to scheduling experiences, a lower proportion of residents reported positive experiences for operational structure (57.4% pre-implementation vs. 32.4% post-implementation, $p = 0.026$) and workload satisfaction (27.7% pre-implementation vs. 5.9% post-implementation, $p = 0.013$) (Fig. 3).

Negative experiences of oncology hospitalist collaboration

Overall, residents reported greater workload dissatisfaction (19.5% pre-implementation vs. 42.0% post-implementation) and resident education dissatisfaction (24.1% pre-implementation vs. 50.7% post-implementation, $p < 0.001$) (Fig. 4). With respect to improvements for education, a greater proportion requested interdisciplinary education support (3.6% pre-implementation vs. 15.0% post-implementation, $p = 0.048$) (Supplement 3). With respect to improvements for scheduling, a greater proportion of residents reported operational challenges

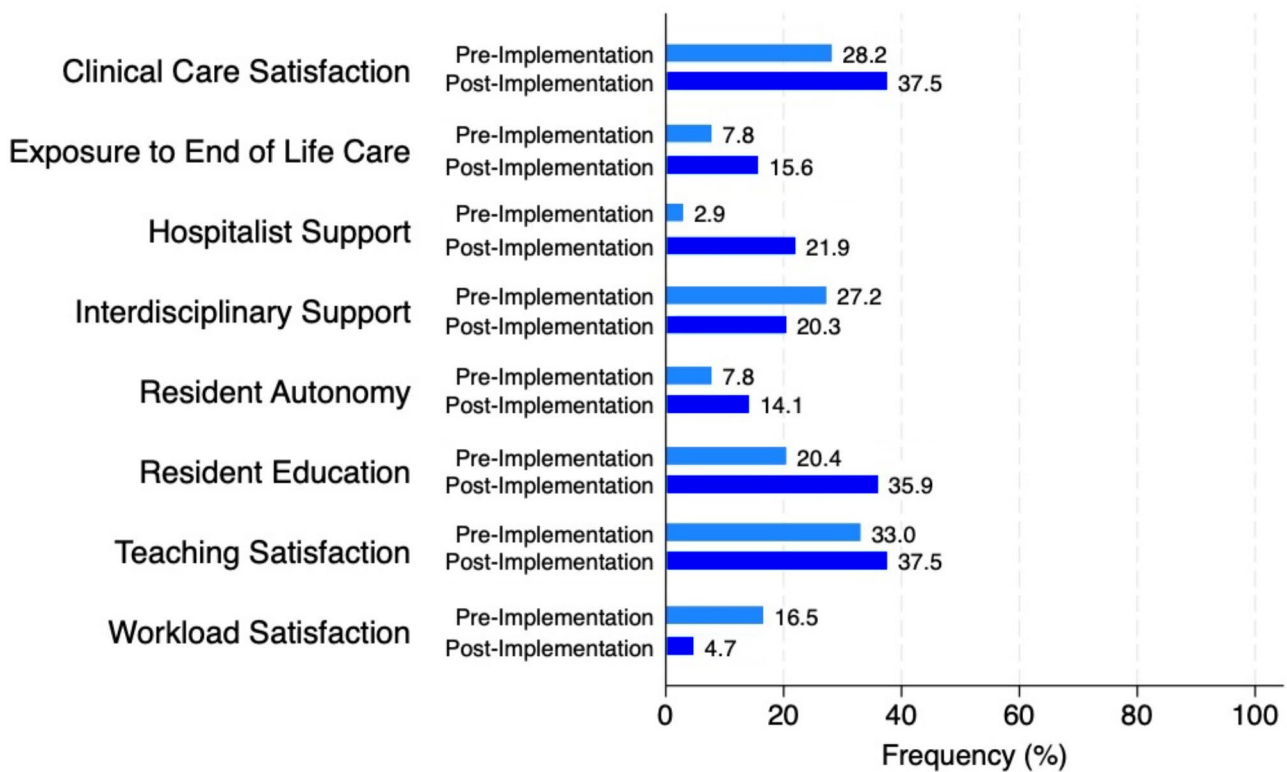


Fig. 1 Overall Positives of Rotation. Note: Significant difference in hospitalist support ($p < 0.001$), resident education ($p = 0.027$), workload satisfaction ($p = 0.022$)

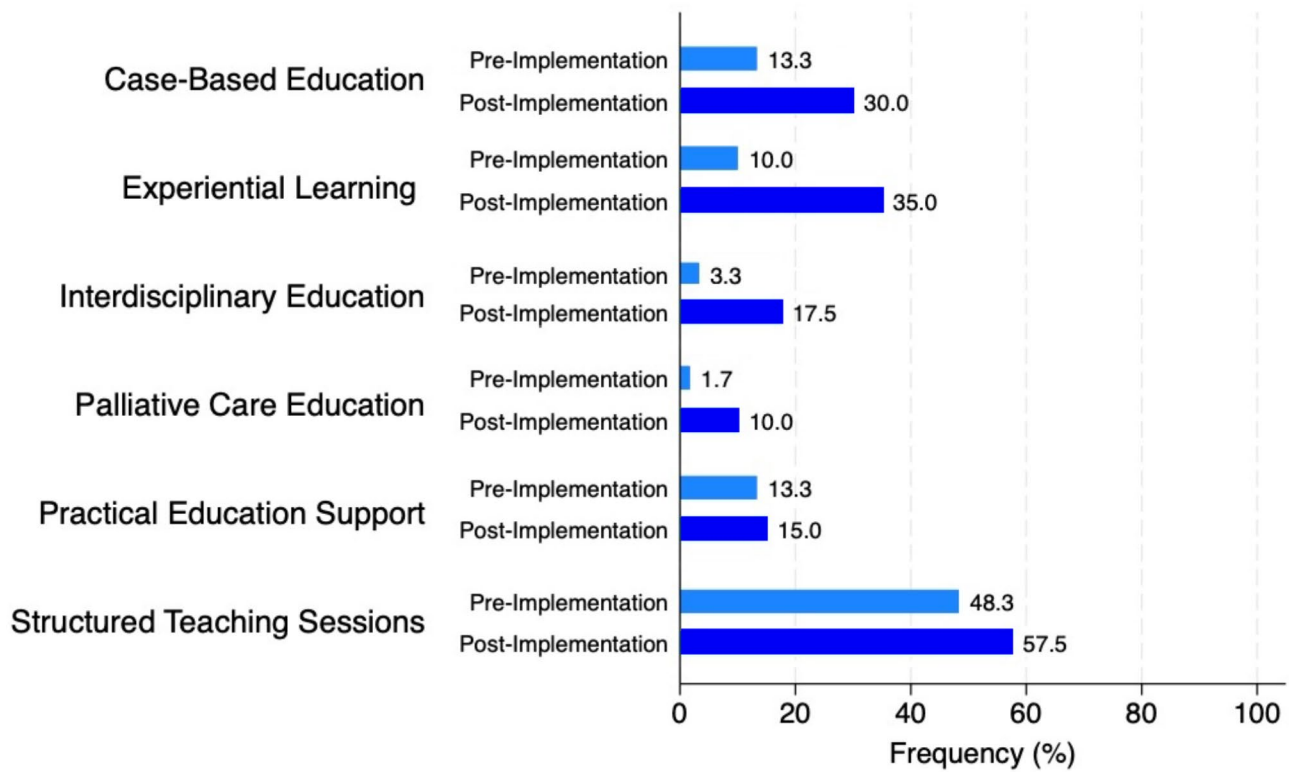


Fig. 2 Positive Educational Experiences. Note: Significant difference in case-based education ($p=0.041$), experiential learning ($p=0.002$), interdisciplinary education ($p=0.015$)

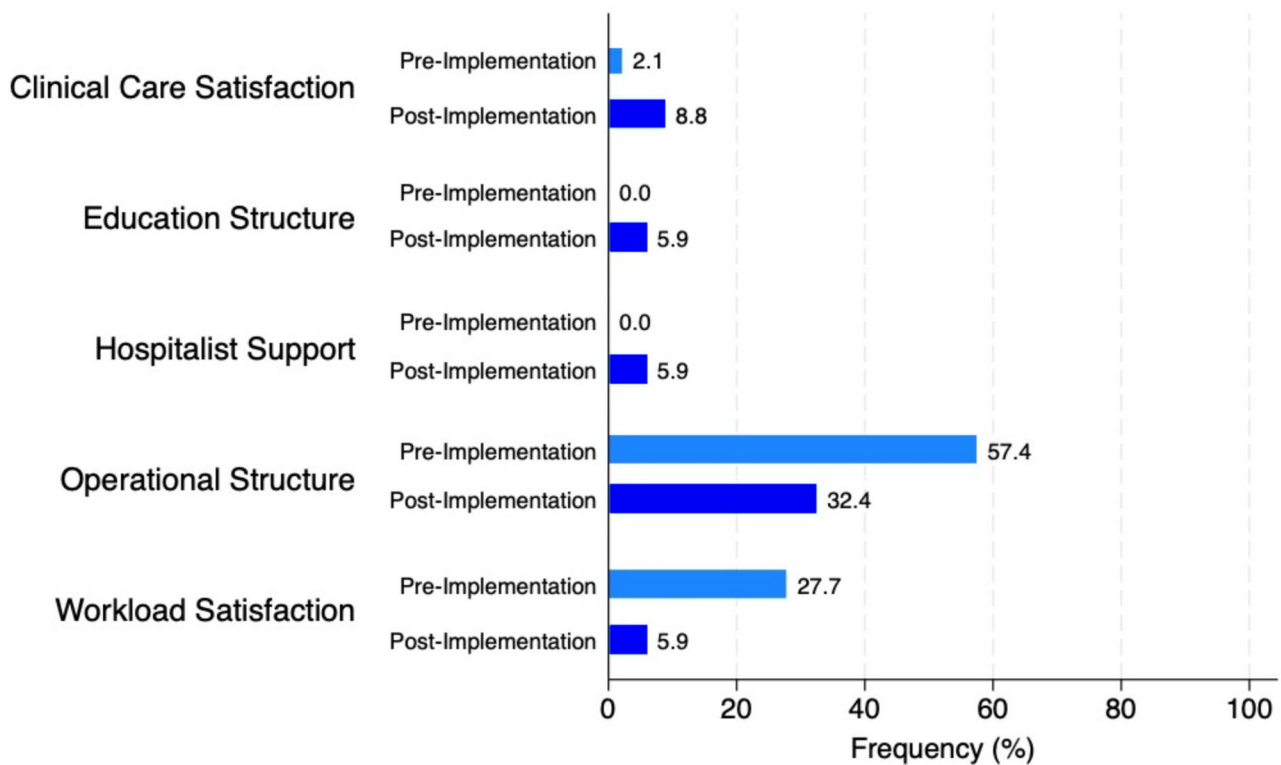


Fig. 3 Positive Scheduling Experiences. Note: Significant difference in operational structure ($p=0.026$), workload satisfaction ($p=0.013$)

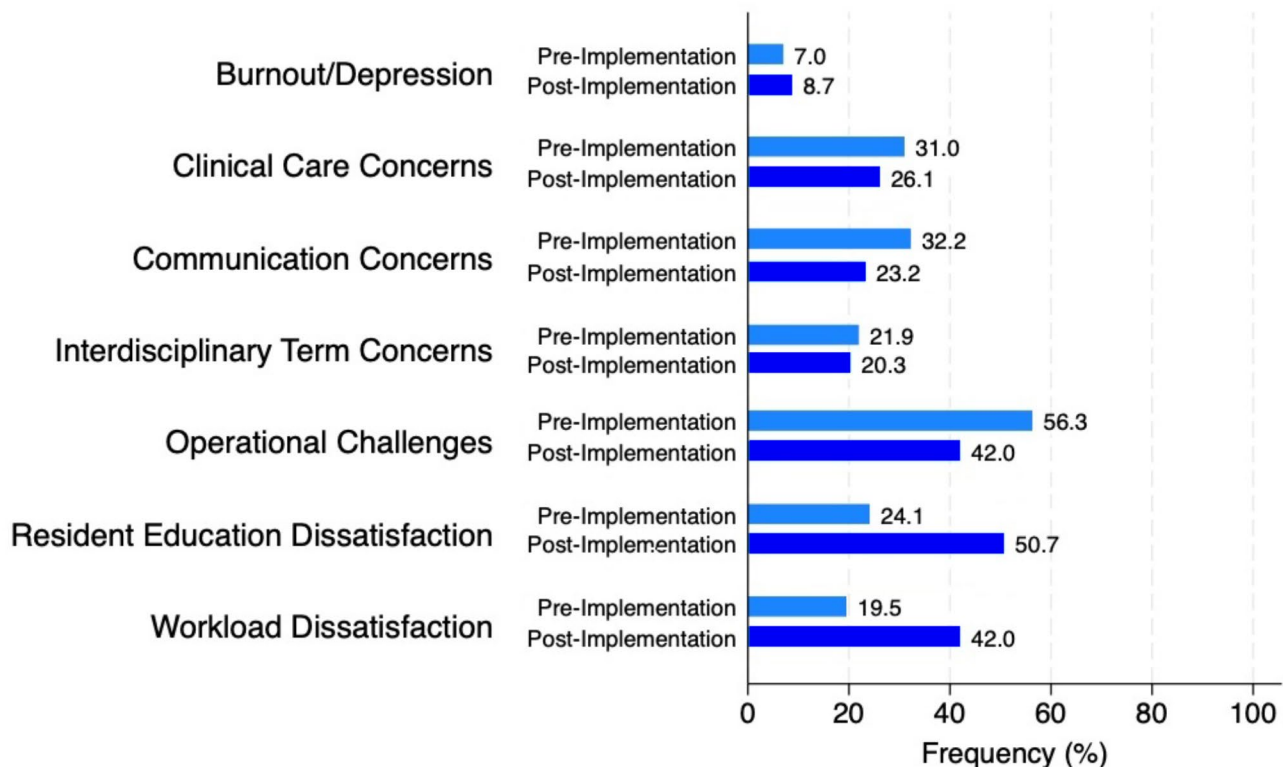


Fig. 4 Overall Negatives of Rotation. Note: Significant difference in resident education dissatisfaction ($p < 0.001$), workload dissatisfaction ($p = 0.002$)

(43.9% pre-implementation vs. 75.0% post-implementation, $p = 0.003$) and burnout/depression (0.0% pre-implementation vs. 12.5% post-implementation, $p = 0.019$) (Supplement 4).

Other comments of oncology hospitalist collaboration

When prompted for comments about the interdisciplinary team, there was less dissatisfaction with nocturnist 1AM/morning interdisciplinary rounds (17.8% pre-implementation vs. 0.0% post-implementation, $p = 0.005$) and greater general satisfaction (17.8% pre-implementation vs. 40.0% post-implementation, $p = 0.023$) (Supplements 5–6).

Discussion

To our knowledge, this is the first study to evaluate the impact of an oncology hospitalist program on medical education. Based on surveys completed before and after implementation of a hospitalist program, there was greater general satisfaction, improved balance of education and clinical demands, greater resident education and greater hospitalist support for internal medicine residents. There was also greater operational challenges and burnout.

Previously-published literature has reported hospitalist programs to have similar or better length of stays, 30-day readmission rates, morbidity, and disposition outcomes,

with satisfaction and acceptance by oncologists [1–3]. For general medical and other specialty services, there have also been good outcomes and acceptance of hospitalist programs by staff physicians [5, 6]. This article adds to the literature, suggesting that medical residents also experience improved clinical and educational experiences with hospitalist-led teams in medical oncology. Specifically, the oncology hospital program allows for greater overall satisfaction with the oncology rotation, satisfaction with attending support in patient care, and overall satisfaction with the educational experience.

Positive outcomes reported, including improved case-based learning and greater experiential education, may stem from the focused presence and inpatient expertise that hospitalists bring to hospital-based oncology care. Hospitalists' primary inpatient responsibility may allow for more hands-on learning opportunities and facilitated deeper engagement with patient management. Increased hospitalist support that residents experienced post-implementation highlights the value of a hospitalist-led model, where dedicated attendings are consistently present throughout the work day to guide clinical decision-making and educational efforts.

Post-implementation, residents reported greater ability to attend morning report lectures and improved balance of education and clinical demands. The improvement likely reflects the scheduling flexibility introduced by the

hospitalist-led teams, which allowed residents to prioritize both their educational and clinical responsibilities. Similarly, the balance between education and clinical demands improved after implementation. Oncology hospitalists attend on service 20 or more 7-day weeks a year, staffing 12-hour days. This intensive, longitudinal experience may enable them to better manage the pace and structure of rounds, allowing residents to focus on educational aspects while improving patient care.

There were some negative experiences reported by residents. Between the two cohorts of residents, those surveyed after implementation reported greater workload dissatisfaction, operational challenges, and feelings of burnout/depression. As with any cross-sectional, survey-based study, it is difficult to assign causality to these associations. Potential confounders contributing specifically to increased proportion of residents reporting negative experiences may include the fact that residents surveyed after the implementation of the hospitalist program trained predominantly during the COVID-19 pandemic, and therefore had longitudinal exposure to training amidst a pandemic. This experience may have contributed to burnout/depression [7, 8] independent of the oncology hospitalist program, which may have downstream effects on subjective reports of dissatisfaction with workload, educational experience, and day-to-day operations. As well, we hypothesize that the addition of hospitalists may have helped reduce length of stay, which may consequently lead to higher perceived workload by residents in the setting of more turnover [9]. There are currently no other data available to review resident experiences before and after implementation of a hospitalist program, but future work at other institutions could explore a matched-subjects study design, in which the same residents are evaluated for their experiences before and after implementation. Additionally, qualitative methods, such as focus groups with residents and staff, could offer deeper insights into the specific factors that contribute to both positive and negative experiences. Lastly, given the potential impact of demographic factors, future studies could examine whether resident experiences with hospitalist models differ based on gender, years of training, or specific oncology subspecialty interests.

A final important note to consider is that there were other smaller structural changes during the study period, in addition to the introduction of the oncology hospitalist program. The residency educational program underwent changes, where morning report was rescheduled to noon, and noon conference was moved from 12:00 to 15:00 before eventual cancellation. As well, there was substantial turnover in multidisciplinary staff during the study period. There was near-total turnover of care managers and social workers, with roles being filled by traveling and interim cross-covering staff respectively. There were

also nursing leadership changes in nearly every inpatient service in the hospital. As such, while the implementation of the hospitalist program was a major structural change affecting the daily work of internal medicine residents, other changes in the residency program and in hospital personnel and practices may have also impacted resident experiences.

The present study demonstrates that oncology hospitalists programs may improve the educational experience and perception of attending support for internal medicine residents rotating on an inpatient medical oncology service. There are limitations, in that this is a cross-sectional survey study of two different cohorts of residents who themselves may not have experienced the alternative rounding models. As previously discussed, future studies could circumvent this limitation by employing matched-subjects design. Given the nature of this survey with open-ended questions, there were times when survey respondents commented on the same concept as both a positive and negative experience, which introduced interpretive challenges for this qualitative study. These results should therefore be viewed as hypothesis-generating. Additionally, oncology-specific education and mentorship was not directly explored. As medical oncology faculty transitioned from attending physician to a consultative role, residents have had less formal interaction with medical oncologists on the inpatient service. Future studies could explore conducting focus groups on staff and medical residents to assess for additional experiences beyond those explicitly mentioned in questionnaires. Finally, future studies could collect demographic data and assess whether the effect of the oncology hospitalist program may be influenced/impacted by patient and/or medical resident characteristics.

In conclusion, the implementation of an oncology hospitalists program was associated with improved education, balance of education and clinical responsibilities, greater satisfaction and hospitalist support with the implementation, among internal medicine residents on an inpatient medical oncology service. There was also greater operational challenges and burnout. Given the overall positive reception, further work can build upon the hospitalist model and explore oncology-specific education and mentorship to supplement the existing educational experience.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12909-025-07142-6>.

Supplementary Material 1

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None.

Author contributions

All authors made substantial contributions to the conception/design/acquisition/analysis/interpretation/drafting of manuscript, have approved the submitted version, and agree to be accountable for contributions to the work.

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Data availability

The datasets generated and/or analyzed during the current study are not publicly available but please contact the corresponding author on reasonable request.

Declarations**Ethics approval and consent to participate**

This study was submitted to Yale University Institutional Review Board and deemed exempt (2000037323). All participants provided informed consent to complete the survey. This study was conducted in accordance to the Declaration of Helsinki.

Consent for publication

Not Applicable.

Competing interests

The authors declare no competing interests.

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