Integrating Behavioral Health Into Cancer Education: Learner Perspectives From a Cancer Education Pathway Program

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ABSTRACT

Introduction: Comprehensive cancer care requires providers to address significant psychological and social challenges, yet behavioral health is often underemphasized in early medical education. The Student-centered Pipeline to Advance Research in Cancer Careers (SPARCC) program provided a setting to enhance learners' understanding of the psychosocial aspects of cancer by integrating behavioral health-focused sessions.

Methods: We evaluated 2 behavioral health sessions implemented as part of the SPARCC curriculum: one addressing the psychological impact of a cancer diagnosis and the other exploring the intersection of cancer and fertility. Learners completed session-specific workshop evaluations and pre- and post-program surveys assessing knowledge, attitudes, and practices. Quantitative data were analyzed using paired *t* tests, and qualitative responses were thematically examined to explore learner perceptions.

Results: From 2019 through 2023, 71 learners participated in the program, the majority identifying as members of groups underrepresented in medicine. Session evaluations ($N=111$) showed consistently high ratings across all categories, with mean scores above 4.25 on a 5-point Likert scale and average overall session ratings above 9.0 on a 10-point scale. Thematic analysis highlighted the value of patient narratives, informal discussion formats, and attention to often-overlooked topics such as infertility and financial burden. Significant improvements were observed in learners' knowledge of cancer diagnosis and treatment and awareness of medical mistrust in underserved populations ($P<.05$).

Conclusions: High learner satisfaction, improved understanding of psychosocial aspects of care, and increased awareness of health disparities suggest that integrating behavioral health and patient perspectives into early cancer education can meaningfully support learner development.

INTRODUCTION

Health care professionals play a critical role in recognizing and managing the psychological burden of cancer. Integrating behavioral health topics into medical education programs, including early health care pathway programs, can enhance clinical knowledge important for patient care.

Pathway enrichment programs are designed to expand access and entry into biomedical research and medical careers, particularly for students from historically underrepresented and marginalized backgrounds. These programs engage learners across the educational continuum – from elementary and high school through undergraduate levels – providing early exposure to health care fields. Common elements include hands-on experiences, academic enrichment, and mentorship, which prepare students for future careers as clinicians, researchers, and other health professionals.

Behavioral health knowledge is important for health care professionals due to the role psychological and social factors play in the onset and course of medical conditions. In oncology, studies suggest that when emotional and mental health support is integrated into cancer care, quality of life, adherence to treatment, and overall health improve.[1] A deeper understanding of behavioral health within medical education encourages learners to think holistically and across disciplines, integrating the mental, social, and physical aspects of care.[2] One strategy to integrate clinical and psychosocial care is to incorporate patient perspectives into medical curricula. Incorporating patient experiences – specifically the

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Table 1. Learner Evaluations for Behavioral Health Sessions, 2019–2023 (N = 111)

Session (Years)	Positive Attitude Toward Teaching[a] Mean (SD)	Used Teaching Materials Effectively[a] Mean (SD)	Communicated Learning Goals Clearly[a] Mean (SD)	Encouraged Active Engagement[a] Mean (SD)	Advanced Understanding of Topic[a] Mean (SD)	Overall Rating[b] Mean (SD)
Patient panel (2019)	4.56 (0.53) (Min 4; Max 5)	4.25 (0.46) (Min 4; Max 5)	4.44 (0.50) (Min 4; Max 5)	4.67 (0.62) (Min 3; Max 5)	4.73 (0.45) (Min 4; Max 5)	9.5 (0.74) (Min 8; Max 10)
Intersection of infertility and cancer (2020-2023)	4.56 (0.63) (Min 1; Max 5)	4.60 (0.54) (Min 3; Max 5)	4.58 (0.57) (Min 3; Max: 5)	4.60 (0.55) (Min 3; Max: 5)	4.72 (0.45) (Min 4; Max: 5)	9.19 (1.32) (Min 4; Max 10)
Psychological impact of cancer diagnosis and treatment (2020-2023)	4.70 (0.43) (Min 3; Max 5)	4.50 (0.59) (Min 3; Max 5)	4.60 (0.49) (Min 3; Max 5)	4.71 (0.46) (Min 3; Max 5)	4.58 (0.52) (Min 3; Max 5)	9.06 (1.08) (Min 6; Max 10)

[a] Rating based on 5-point Likert scale (1 = poor; 5 = outstanding).
[b] Rating based on 10-point Likert scale (1 = poor; 10 = excellent).

impact of their diagnosis and their interactions with the health care system – into medical education programs has demonstrated benefits on patient-provider communication and patient satisfaction.[3] Instilling future health care professionals with core behavioral health knowledge is necessary for whole-patient care.[3]

Despite the demonstrated success of pathway programs advancing educational and career outcomes, limited research has examined how learner perceptions and experiences are influenced when behavioral health topics are integrated into medical education.[4,5] This study aimed to explore the impact of integrating the Student-centered Pipeline to Advance Research in Cancer Careers (SPARCC) behavioral health curriculum into in a cancer education pathway program, with a focus on how this affects learners' perceived benefits from behavioral health-focused educational sessions and their understanding of the psychosocial dimensions of cancer care. The objectives were to increase awareness of the psychological and emotional challenges faced by individuals with a cancer diagnosis, highlight the importance of integrating behavioral health into cancer care, and foster empathy and reflective thinking among future health care professionals.

METHODS

Overview

Established in 2018, SPARCC was an 8-week summer research program funded by the National Cancer Institute (NCI) (National Institutes of Health [NIH]/NCI R25 CA 221715) designed to strengthen the pathway for underrepresented minority (URM) students to pursue careers as clinical research professionals or advanced degrees in clinical cancer research.[6] PARCC's programmatic design included hands-on research experience, clinical practicums, mentorship, and professional development within a robust cancer research environment. The curriculum was structured around the Joint Task Force Clinical Trials Competency Domains, with emphasis on social determinants of health and principles of culturally responsive care.[7] Daily workshops addressed key topics, including the design and management of clinical cancer trials, cancer prevention and care, and academic and career guidance, with the intent to prepare learners for future health care and research careers. The specific goals of the behavioral health sessions were to highlight the patient-centered impact of a cancer diagnosis and foster understanding of the psychological and social aspects of patient care.

Eligibility criteria for SPARCC were intentionally broad to ensure access and inclusion. Students were eligible if they were rising juniors and seniors enrolled in 4-year undergraduate programs, enrolled in 2-year associate degree programs, or were recent college graduates. While applications were open to all students, URM students were strongly encouraged to apply, consistent with the NIH/NCI priorities at the time.

To support recruitment, SPARCC established partnerships with 7 higher education institutions across Wisconsin, including 2 designated as Hispanic-serving and women-only universities. Recruitment sessions were held both in-person and virtually to ensure access. These sessions provided an overview of the program's structure, expectations, benefits, guidance for preparing a competitive application, and strategies for securing robust letters of support. To expand recruitment efforts beyond the Midwest, SPARCC was advertised nationally through postings on Handshake (an online career network) and the Association of American Medical Colleges Medical Pathways and Enrichment Opportunities website.

Intervention

Two educational sessions focused on behavioral health were implemented as part of the SPARCC curriculum. The first session, "Psychological Impact of a Cancer Diagnosis," was an instructor-led didactic session exploring the emotional effects of receiving a diagnosis. Active learning strategies were used to engage learners through small- and large-group discussions. In addition to the didactic session, a patient panel featuring survivors who shared personal narratives highlighting the emotional and psychological challenges of diagnosis and treatment was offered 1 year. This session aimed to help learners understand the human experience of cancer and the role of behavioral health in cancer care. The frequency of patient panels was limited due to the COVID-19 pandemic.

The second didactic session, “Intersection of Cancer and Fertility,” focused on oncofertility and the reproductive health implications of cancer treatment. The session highlighted the psychological sequelae of a fertility-related diagnosis and the impact on family planning and psychosocial well-being in the context of cancer care. Real-world case examples and facilitated group discussions emphasized psychological, social, and ethical considerations related to fertility preservation and treatment.

Table 2. SPARCC Knowledge, Attitudes, and Practices

Survey Item	Pre-Program Mean (SD)	Post-Program Mean (SD)	*P* value
I am knowledgeable about cancer diagnosis and treatments	5.17 (1.51)	5.84 (1.54)	.01
I am aware of issues relating to medical mistrust among underserved populations	6.13 (1.10)	6.50 (0.76)	.01
I can list the social determinants of health	5.26 (1.60)	5.71 (1.60)	.12
I am familiar with culturally responsive strategies used with patients and patient families	5.28 (1.64)	5.75 (1.77)	0.17
I feel empowered to advocate for historically underrepresented /marginalized groups	4.67 (0.49)	4.75 (0.62)	.67
I feel a sense of belonging in medicine/research	5.83 (1.56)	6.00 (1.50)	.51

Abbreviation: SPARCC, Student-centered Pipeline to Advance Research in Cancer Careers.
Survey used a 7-point Liker scale: 1 = strongly disagree; 4 = neutral; 7 = strongly agree.

Data Collection

To assess the impact of SPARCC’s behavioral health curriculum, we conducted a program evaluation using pre- and post-surveys with quantitative scales and qualitative open-ended questions.[7] The Knowledge, Attitudes, and Practices (KAP) framework, commonly used in public health research, was adapted to evaluate changes in learners’ knowledge and attitudes related to clinical cancer research. Learners completed the standardized SPARCC KAP evaluation at the start of the program and 6 months after completion (Appendix 2 – SPARCC KAP). Quantitative items assessed changes in knowledge and attitudes, while open-ended responses provided deeper insight into learner experiences.[8] For this analysis, we selected 6 items from the 17-item SPARCC evaluation based on their relevance to behavioral health, defined as the integration of psychological, social, cultural, and structural factors that influence health outcomes. These items were selected because they address multiple dimensions of behavioral health competence: awareness of health inequities and disease contexts (eg, cancer and social determinants of health), understanding of social and cultural barriers to care (eg, medical mistrust and responsiveness), and development of professional attitudes that foster advocacy, inclusion, and belonging.

In addition to the SPARCC KAP, learners completed session-specific workshop evaluations immediately following each workshop (Appendix 1 – SPARCC Workshop Evaluation). All data were collected via Research Electronic Data Capture (REDCap), a secure web-based application that stores and links participant data longitudinally.[9]

Data Analysis

Changes in KAP responses were analyzed using comparison of means, standard deviations, paired *t* tests, and *P* values to assess changes over time. Open-ended responses from session-specific evaluations were analyzed using thematic analysis to better understand learner experiences and perceptions.[10] Two members of the research team (NT, ZA) collaboratively reviewed and coded free-text survey responses in a shared Excel spreadsheet, assigning initial codes that reflected specific ideas or sentiments (eg, “patient perspective,” “psychosocial impact,” “informality of session,” “financial burden”). Researchers met to compare code lists, resolve discrepancies, and develop a shared code list. Related codes were then grouped into broader themes based on recurrent ideas and pattens. The remaining research team members reviewed the final themes and representative quotations to ensure consensus. This educational activity evaluation was exempt from institutional review board review as it was part of the approved programmatic evaluation for the SPARCC program (May 24, 20218, PRO31976.)

RESULTS

The comprehensive SPARCC pathway program was offered from 2019 to 2023 with a total of 71 learners. The majority of participants were women (73% [52/71]); 67% (48/71) self-identified as a member of a group underrepresented in medicine or biomedical research (eg, Black/African American, American Indian or Alaska Native, Native Hawaiian/other Pacific Islander, Hispanic/Latino). Learners represented 4 major regions of the United States (East, West, South, and Midwest), with the majority from the Midwest (86% [61/71]). Almost all learners were close to graduating or already graduated from a 4-year undergraduate degree program (96% [68/71]), and most intended to pursue a career in research (86% [61/71]) upon completion of their degree. From 2019 to 2023, SPARCC KAP pre- and post-program evaluation data were collected from all 71 learners (100% completion rate). Behavioral health session-specific evaluation data (N=111) were also collected during this time. Across all 5 years, the workshop evaluation completion rate was 61% (43/71). Results did not demonstrate differences in learner evaluations across virtual and in-person formats.

Table 1 presents aggregated learner evaluations of the behavioral health sessions. Across all sessions and years, mean ratings in each category remained above 4.25 out of 5, indicating that learners consistently perceived the sessions as effective, relevant, and enriching. Learners provided an overall rating of session facilitation on a 10-point Likert scale (1 = poor; 10 = excellent) and rated facilitator qualities (eg, attitude, efficacy, skill) on a 5-point Likert scale (1 = poor; 5 = outstanding). Higher mean scores reflected greater learner satisfaction, perceived facilitator effectiveness, and learning impact. Learners also had the opportunity to provide free-text responses with additional comments or reflections on the session content.

In addition to high quantitative ratings, thematic analysis of 82 free-text responses revealed key insights into learners' perceptions of the subject matter. Representative themes and exemplar quotes are summarized below.

1. Patient Narratives Informing Practice

Learners described how hearing directly from cancer patients and caregivers deepened their awareness and understanding of cancer's psychosocial impact.

> *"I found it so amazing to hear more people talk about themselves. The group was very dynamic, and I think that was needed. The attitude made a huge difference, which was an important takeaway." (Cohort 1, 2019)*

2. Bridging the Gap

Learners noted that the sessions filled gaps in a traditional science-based education by connecting emotional and mental health with cancer care.

> *"I really enjoyed discussing the psychological impacts of cancer diagnosis, treatment, and remission; it is probably one of my favorite topics so far. This topic is pretty different from what we've been discussing so far, but mental health is just as important to someone's well-being as their physical health. I thought the facilitator did a wonderful job of putting these thoughts and feelings into perspective." (Cohort 2, 2019)*

> *"I loved how engaging [the facilitator's] presentation was. It was nice to gain insight into her field and what she does without being bombarded with statistics and technical facts. It was nice to have a more abstract look into what patients facing a cancer diagnosis may experience emotionally and how different people may cope with that." (Cohort 3, 2021)*

3. Naming the Overlooked

Learners recognized the importance of acknowledging the often-unaddressed aspects of cancer care, including emotional toll and reproductive implications of treatment. Learners particularly appreciated the discussion of infertility and receiving a cancer diagnosis, especially for women of lower socioeconomic status (SES).

> *"Cancer and infertility are so common but not talked about enough. I am happy we could discuss this and I am happy we could see the costs, scenarios and we could be emphatic (sic) about a condition we do not know." (Cohort 1, 2019)*

> *"Cancer alone is a very hard issue to discuss with patients, I can't even imagine the added stress patients endure when also discussing infertility. The price of fertility preservation is also another huge issue that disproportionately affects lower and middle-class patients. I am curious as to how many people decide to go through with infertility services despite the cost versus how many people don't even consider it due to their finances and how these numbers vary across SES." (Cohort 2, 2020)*

4. Authentic Conversations for Learning

Learners appreciated the interactive, less formal, and more conversational structure of the sessions, which afforded more comfortable engagement with sensitive topics.

> *"I really liked the layout of this talk. It was short, quite informal, yet very effective. I liked how it was just kind of a conversation and after continuous workshops with heavy content. I liked how [the presenter] didn't have a PowerPoint and it was more of a casual conversation where she asked a lot of questions." (Cohort 2, 2020).*

> *"Loved how it was not formal. We were literally talking with one another instead of her talking at us." (Cohort 3, 2021)*

5. Emerging Advocacy

Learners increasingly became aware of and frustrated by the financial barriers associated with cancer treatment and its impact on fertility. They appreciated learning how these barriers contribute to distress in patients, especially as it related to fertility preservation. This observation tied strongly to students' motivation for advocacy.

> *"This was an important conversation to have. Patients with cancer face so many difficulties that I almost forget that infertility compounds these challenges. I'll reiterate what [another student] said about how frustrating it was to learn about the financial burdens to fertility preservation." (Cohort 2, 2020)*

Learners also completed pre- and 6-month post-program surveys using a 7-point Likert scale (1 = strongly disagree; 4 = neutral; 7 = strongly agree). Two of the 6 selected survey items demonstrated statistically significant changes. A paired samples t test showed that knowledge of cancer diagnosis and treatment increased from pre-program (mean, 5.17; SD, 1.51) to post-program (mean, 5.84; SD, 1.54; $t(69) = -2.52$; $P < .05$; $d = 0.30$). Awareness of issues relating to medical mistrust among underserved populations also significantly improved, increasing from pre-program (mean, 6.13; SD, 1.10) to post-program (mean, 6.50; SD, 0.76; $t(69) = -2.28$; $P < .05$; $d = 0.27$). Although the remaining 4 items did not reach statistical significance, all demonstrated positive directional change, with learners reporting greater familiarity with social determinants of health and culturally responsive strategies and modest gains in advocacy and belonging. Full results are shown in Table 2.

DISCUSSION

Findings from 5 years of the SPARCC program demonstrate the benefits of integrating behavioral health-focused sessions into a cancer education pathway program. Learners consistently evaluated the sessions highly across all criteria, suggesting strong satisfaction and educational value. Qualitative feedback reinforced these results, indicating a meaningful influence on how learners understood the subject matter.

Learners emphasized the profound impact of hearing directly from cancer patients and caregivers and exploring the emotional, relational, and reproductive consequences of a cancer diagnosis. This firsthand perspective deepened their understanding of the psychosocial challenges associated with cancer. Many described the sessions as a significant departure from traditional science-focused training, offering essential insight into the human experience of cancer. Learners particularly valued discussions related to oncofertility, the financial burden of fertility treatment, and its impact on mental health – topics they identified as underrepresented in their formal education. These themes resonated strongly with participants, who expressed frustration and heightened motivation for advocacy.

These findings align with existing literature demonstrating the value of incorporating patient perspectives into health professions education.[11-14] Prior studies show that engagement with patient narratives enhances empathy, strengthens communication skills, and improves understanding of complex psychosocial issues.[11,12,14] By embedding these experiences within a structured, early-stage pipeline program, SPARCC provides a model for cultivating emotionally attuned and equity-minded future health professionals.

Learners also appreciated the interactive, conversational format of the sessions. This approach facilitated emotional engagement and supported a more meaningful exchange of ideas, particularly around sensitive topics such as infertility and cancer – especially for women from marginalized groups.

Beyond satisfaction, survey data showed improvements in 2 key areas: knowledge of cancer diagnosis and treatment and awareness of medical mistrust among underserved populations. These findings suggest that the sessions were not only well received but also had a measurable impact on understanding both clinical and psychosocial dimensions of cancer care. Although other items did not reach statistical significance, all demonstrated upward trends in mean scores, indicating potential benefits that may require larger samples or more targeted interventions to assess fully. Not all sessions were designed to directly influence broader program goals, which may have similarly influenced the degree of measurable change.

Many SPARCC learners identify as members of historically underrepresented groups in medicine. Integrating behavioral health education within culturally responsive medical education programs may validate learners' lived experiences and support professional identity formation. Learners also reported that the sessions encouraged advocacy and reinforced their motivation to address health disparities and the emotional and mental health needs of patients in their future careers.

Challenges and Recommendations

This study has limitations. Transitioning from in-person to virtual formats during the COVID-19 pandemic restricted direct patient participation for panel discussions, limited learner engagement, and reduced available evaluation data. Future implementation of behavioral health content in medical education or pathway programs should explore hybrid models or prerecorded patient narratives to preserve the depth of patient interaction and reduce barriers. Additionally, learner feedback favored informal, discussion-based formats over traditional lectures, suggesting that emotionally resonant content may be best delivered through interactive, learner-centered approaches. Finally, there were limited survey items aimed at assessing questions of interest, and only a small number of learners provided free-text responses, further limiting available data.

CONCLUSIONS

Integrating behavioral health and patient perspectives into cancer education may enhance learner understanding of the psychosocial dimensions of care. SPARCC demonstrates the importance of and benefit of embedding such content into early pathway programs, particularly those focused on equity and diversity in the health professions. Additionally, this content can be incorporated in a feasible and effective manner. Health care educators should consider the value of integrating behavioral health into their curricula. Expanding these efforts may support the development of future health care professionals who are not only scientifically competent but also attuned to the emotional and social needs of their patients.

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