Enhancing Child and Adolescent Psychiatry Recruitment Through a Medical Student Mentorship Network: A Qualitative Study

Anita Kishore¹ • Madeline DiGiovanni² • Kevin Lee Sun¹ • Alexander Kolevzon³ • Laelia Benoit² • Andrés Martin²

Received: 22 December 2021 / Accepted: 15 August 2022 / Published online: 19 September 2022

Abstract

Objective There is a shortage of psychiatrists necessary to meet the clinical needs of children and adolescents. Efforts over the past decade to enhance the workforce have had a limited impact. This study sought to identify the critical components of a medical student mentorship network designed to increase recruitment into the subspecialty.

Methods The authors conducted interviews via synchronized videoconferencing of network site leaders and medical students at 14 schools throughout the USA. In addition, they analyzed verbatim transcripts using a thematic-phenomenological qualitative approach.

Results The authors interviewed thirty-eight program participants during seven focus group sessions: nine program directors and 29 medical students or graduates, a median of five participants per session. They constructed a framework consisting of two overarching domains, comprised of three themes each: (1) life cycle of a subspecialty mentorship network (Origins, Initiation, and Continuity); and (2) next steps to improve the program (Refining goals, Increasing accessibility, and Defining a path forward).

Conclusion Preliminary data have already documented the positive impact of participation in this mentorship program on medical student match rates into psychiatry. The qualitative model of this study provides a blueprint to develop, maintain, and optimize this and similar efforts aimed at increasing the child and adolescent psychiatry workforce.

Keywords Child and adolescent psychiatry • Mentorship • Recruitment • Qualitative

There is a well-documented shortage of psychiatrists necessary to provide adequate health care to children and adolescents, even despite a recent increase in general psychiatry residency applicants [1–3]. Efforts over the past decade to enhance the workforce, including the creation of Triple Board Residency Programs and increased collaboration with pediatrics, have had limited impact on recruitment [4]. Addressing this shortage may require a focus on earlier stages of education, when medical students are contemplating different specialties, seeking opportunities, and asking for guidance. Tapping into these learners’ initiative and dormant potential,

© The Author(s), under exclusive licence to American Association of Chairs of Departments of Psychiatry, American Association of Directors of Psychiatric Residency Training, Association for Academic Psychiatry and Association of Directors of Medical Student Education in Psychiatry 2022

λαμπάδια ἔχοντες διαδώσουσιν ἄλληλοις Those who have torches will pass them on to others.
— Plato, Republic 1.328a

Our chief want in life is somebody who will make us do what we can.
— Ralph Waldo Emerson

Anita Kishore
akishore@stanford.edu

1 Stanford School of Medicine, Palo Alto, CA, USA

© Springer

² Child Study Center, Yale School of Medicine, New Haven, CT, USA

³ Icahn School of Medicine at Mount Sinai, New York, NY, USA
faculty can initiate mentorship relationships so that students potentially identify with the traits and work of their mentors [5]. The emerging literature on a specific medical student mentorship network supports this idea.

The Klingenstein Third Generation Foundation (KTGF) has funded a mentorship network of medical school programs across the country that empower medical students to engage with the field of child and adolescent psychiatry (CAP) through mentored relationships. The Foundation supported the first site in 2002; other schools subsequently applied for funding through a competitive request for proposals. The program expanded into the current 14-site network by 2019. Using a developmentally informed approach, the KTGF Medical Student Mentorship Program National Network (MPNN) offers educational opportunities accessible from the start of medical school [6]. As early as their first year, medical students engage with CAP by being paired with mentors, observing clinical encounters with youth, and conducting subspecialty-related research, among other activities [7]. Preliminary data suggest that these early mentored experiences have affected medical students’ match rates into psychiatry [8].

Another essential form of engagement with the MPNN is its annual National Medical Student Conference (NMSC), which attracts over 90 students from the Network sites and features student presentations on research, education, outreach, and creative projects. Previous research found that conference attendance improves students’ perceptions of CAP and their reported likelihood of entering the field, although this effect was time-limited [9].

Given the evidence for the MPNN and NMSC’s salutary effects on medical students’ perspectives on CAP and match rates into general psychiatry, we sought to identify the active components of the MPNN that may facilitate recruitment into CAP. Acknowledging that differences exist between the 14 programs, we used a qualitative approach to explore student and faculty perspectives at different schools, highlight success and areas for improvement, and inform the development and optimization of similar programs.

Methods

Participants and Procedure

We conducted focus groups in the spring of 2021 via synchronized video conferencing using Zoom. For participant selection, we collaborated with program directors at all 14 sites, who recommended a selection of current and former students. AKi led semi-structured interviews for those who accepted, with two co-authors (MD, KLS) joining and contributing to all sessions. After the first two focus groups, we conducted faculty and student sessions separately to maximize candid feedback unencumbered by power differentials or social desirability. All participants provided verbal consent for digital recording of their session.

Qualitative Analysis

We transcribed digital audio files using Rev prior to analysis aided by NVivo 12 software. We used thematic analysis [10, 11] with an interpretative phenomenological approach to examine the participants’ experiences [12, 13]. Three authors (AKi, MD, KLS) independently identified and organized codes before sharing them toward further refinement and finalization into a streamlined codebook. LB contributed to the framework. Multiple supporting quotes undergirded overarching domains and their underlying themes. We organized transcripts iteratively until reaching theoretical sufficiency [14] and following best practice guidelines for analyzing, drafting, and submitting qualitative studies [15, 16]. In keeping with the principles of participatory research [17], we value study subjects as co-investigators and invited all participants to review and comment on the final domains, codes, overarching conclusions, and draft manuscript.

Results

Thirty-eight former or current network participants contributed to seven focus groups (with a median of five participants per session). Students, including MD/PhD candidates, ranged in enrollment year (1st–7th), and incorporated graduates (1–13 years out of training). Faculty had a median of 6 years (range, 1–19) of experience leading their respective site and typically included a founding leader and a more recently recruited co-leader.

Based on our analysis, we developed a framework organized along two overarching domains, in turn comprised of three themes each.

The Life Cycle of a Subspecialty Mentorship Program

Origins: Why Develop a Child and Adolescent Psychiatry Mentorship Program?

Program leaders sought out participation in the MPNN not just to increase recruitment into the subspecialty but to “pay forward” quality mentorship they had received. They identified mentorship as a pivotal experience in their own histories, finding themselves “in a career and position that I never, ever imagined… that was entirely facilitated through mentorship.” Specifically, the mentorship program allows participants to cultivate a specific kind of mentorship, one that emphasizes building a home base within the broader house of medicine by resorting to “just-in-time, PRN mentorship”; to bite-sized wisdom accumulated informally and intermittently. Mentors
valued flexibility, noting that “part of why I think we’ve thrived as a network is that we have not been rigid,” allowing students to customize their time commitment to the program and welcoming the ebb and flow of their engagement, “depending on their season of [medical school] life.” One participant described their mentor, who “would just open the door and let me come back in, make space for me, give me a project” throughout multiple stages of their career. Participants also used negative experiences in their trajectories to guide their mentoring goals through the program, as with one mentor who now encourages “spitting out” ill-fitting partnerships after having prior research interests “frozen” for years by their mentor. Thus, in developing the program at their respective institutions, mentors shared the reflective, intentional goal of passing on the same kind of flexible guidance they valued in their careers.

In the medical student groups, participants described an eagerness to connect with experienced faculty who could provide opportunities, insight, and narratives about life in CAP. This hunger for accessible knowledge characterized all participants, regardless of whether they considered CAP as a career option at the beginning of their medical school trajectory. In addition, the notion of a multipurpose source of guidance through intermittent and varied exposures rather than a single longitudinal relationship echoed the goals of the mentor group as conducive to more effective and sustained mentorship across students’ professional development.

Initiation: What Drives Students Toward a Subspecialty Mentorship Program?

In exploring decisions to join the program, we discovered an array of “hooks,” both practical and abstract, that attracted students. From a practical standpoint, students appreciated the opportunity to learn more about the subspecialty; not through lectures, but through real-life experiences and stories from practitioners — and especially from patients: “Focusing on patient talks and patient experiences, that’s something really missing from a lot of the preclinical classes. You get to learn all this info, but you don’t learn about the human beings behind it.” Echoing faculty member goals, students appreciated the flexible and non-binding nature of the mentorship component, noting that their programs allowed students to “diversify” experiences with multiple clinicians if desired. From a more abstract standpoint, students gravitated toward the program because it offered a sense of belonging, an ecological niche within the broader ecosystem of the medical community. Students frequently spoke of the joy of “finding your people” and the growing confidence to follow in their footsteps: “[They] think like me, they’ve probably had similar worries as me, and they’ve figured things out.” This sense of belonging was particularly impactful for first-generation medical students, who appreciated having mentors help them map out a career blueprint in which they could see themselves (Table 1).

Another central “hook” we identified is the MPNN annual conference, which many participants cited as a core feature of their involvement. For most participants, the conference figured as a unique and early opportunity to gain experience and connections within the relatively small CAP community: “That’s something really special that doesn’t exist otherwise across schools: meeting your colleagues very early and growing together.” Students valued the opportunity to forge connections with like-minded peers and mentors and found the conference helpful in decreasing stigma and increasing the legitimacy of psychiatry as a medical specialty: “Getting exposed to the different types of research that people are doing really showed me how cutting-edge psychiatry is.” For many participants, the conference’s collegiality bolstered its character not as a formal academic meeting but as emblematic of the playfulness at the discipline’s core. During the annual conference, academic events are interwoven with friendly competitions and team-building exercises, cultivating an informal and accessible environment in which to become familiar with peers: “I think that’s really great about the MPNN… and that’s part of child psychiatry too… we like to [play and] have fun.”

Mentees valued the annual conference to gain competence and validation as genuine members of the CAP community. Students identified the conference as a vehicle to gain experience in research endeavors, to present to colleagues and faculty, and to network with prestigious leaders in the field who figured as exemplars of what life in CAP could be. Multiple participants described the conference as a “low-stakes,” “supportive,” and “non-threatening” environment in which to make an academic presentation for the first time. This experience later proved valuable during the residency application process. Students marveled at faculty participation from other institutions “[asking] kind, genuine questions” after presentations. Sharing scholarly projects fostered connections as well: more than once, a “small connection” after a participant’s presentation culminated in a publication at the encouragement of another.

Continuity: How Is Program Involvement Sustained Throughout Medical Education?

In exploring the drive behind students’ continued involvement, we found that “relentless” mentorship kept many participants grounded in the CAP environment, with mentors encouraging continued networking and project development throughout medical school. Participants frequently commented on mentors as “an accelerant” or “gentle pressure” to reach for opportunities they may not have otherwise, highlighting the importance of mentor-initiated interactions as sustaining student involvement in the field. However, participants knew that sustained mentorship need not come from one lone mentor. Instead,
multiple participants shared the view of building a team of guides to help them synthesize new knowledge of the discipline and seek out more opportunities, echoing the mentors’ recurrent highlight on flexibility: “How do I assemble a team of people… who are going to go to bat for me in different ways?” Mentees described appreciation for the warmth of mentorship relationships, citing feelings of being “taken under [a mentor’s] wing” or having someone “in their corner,” not just to advance their recruitment into CAP, but out of genuine care for their personal and professional growth: Mentors are “there to help you become who you want to be… It’s not about investment [in] your choosing a particular career that they want you to go into; it’s about helping you find your path.” For some participants, the strength of this mentor relationship was reason enough to stay involved in the program, even if eventually settling on another field.

Although not all participants pursued psychiatry or CAP in the post-graduate phase, mentees identified their MPNN experiences as valuable to their chosen careers since “psychiatry does leak into every specialty in medicine.” Participants valued staying in touch with CAP colleagues they met at conferences, and some were even recruited into fellowships by MPNN contacts. Mentees who did pursue CAP tapped into mentors during residency at pivotal points, and several program graduates reflected on becoming mentors themselves, seeking out the MPNN at their new institutions, and continuing to attend conferences to support new students.

**Evaluating Next Steps to Improve the Program**

Despite consistently positive feedback, participants were thoughtful in evaluating their critiques of the program in its current form. As a result, we identified three main “growth points” (Table 2).

---

**Table 1 The life cycle of a subspecialty mentorship network**

| Stage | Sample quote |
|-------|--------------|
| Origins | [We had] this radical idea that if you want med students to go into psychiatry and child psychiatry specifically, maybe they ought to see a little of it, hear a little about it, or meet some faculty who loved what they were doing, while they were in med school, because it made it more likely that they might choose it if they heard of it. (Program leader) |
| Initiation | I don’t come from a family of physicians or know anyone who is a physician. So I think what the mentor really was showing me what my life could be, showing the ins and outs, the daily. This is what I do, and this is what I’m able to do outside of it. This is what your life could look like and showing you the way of how to get there. And I think what the program was able to do for me is almost give me that kick in the butt to go do it. (Student participant) |
| Continuity | When it came down to it, the program was actually a big part of why I chose to end up continuing in child psych because I felt like the community of people were people that, when I had a lot of free time during COVID, the things that I was looking into and the things that I was researching, those were the conversations that I was having at the program conferences. And then, I guess, I said it before, the community of child psychiatrists, it really appealed to me as something that years from now I would be very excited to go to conferences and stuff like that. (Network graduate) |

---

**Refining Goals: Do the Network and Its Constituent Programs Fulfill the Intended Purpose?**

The MPNN’s mission is to increase recruitment into CAP through intentional and flexible mentorship, but we found that both mentors and mentees harbored doubt as to whether the program effectively advanced its specific goals. Regarding recruitment aims, mentees felt that programming is “more about supporting the already invested students” rather than genuinely increasing awareness and bringing new students into the fold. Mentors and mentees alike raised concerns about the effectiveness of outreach strategies, such as whether email listservs reach only a self-selecting audience of students who signed up for interest groups rather than the broader audience of all potentially interested students. Across institutions, the outreach challenge is complicated by an inconsistent delineation between CAP and general psychiatry interest groups; at some schools, they are the same, but at others, they are separate groups with separate listservs — at times synergizing less than competing for “market share.” Finally, mentors and mentees fretted over potentially interested students who “fell through the cracks” and did not find the program until later in their education.

Despite mentors’ flexibility and several mentees’ success with highly invested faculty, participants from both groups identified challenges to the sustainability of high-quality mentorship, given the funding and time constraints at their institutions, as well as the concentration of available mentors in academic psychiatry. Mentors described an “uphill battle” of keeping colleagues involved as their responsibilities pulled them elsewhere, and mentees were well aware of the demand on faculty and the consequent limitations on the pool of mentors: “He’s just like a really busy guy. We met once and I don’t think we talked again.” Mentors spoke of coordinating the MPNN on “donated time” given a lack of protected hours to dedicate to the program and...
Table 2  Evaluating next steps to improve the program

| Stage                        | Defining question                                           | Sample quote                                                                                                                                 |
|------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Refining goals               | Do the national network and its constituent programs         | Just from a faculty perspective, I think that doing a little bit more mentorship in adult residency is important because that attrition can be significant for all the reasons that all of us have talked about. I know that our mission is really for medical students, but I think that also looping in and really involving adult residents is important. (Program leader) |
| Increasing accessibility     | Is the annual conference a possibility for all students?     | If [research] is a gateway that you have to get [through] to get to this conference, then there’s just going to be all of these [primarily clinically oriented] people who might be interested in child psychiatry, who the program just isn’t going to reach. (Network graduate) |
| A path forward               | How to move toward a more effective subspecialty mentorship program? | If there’s a way… where you don’t have to have research… that could just open a lot of doors, and it could maybe also show people that there’s other ways to be a physician. Obviously, research is super important, but there are also ways to be a physician without being research heavy. There are physicians who are big writers, science writers, and that’s important too, because you need to be able to communicate with other people about science. That could be very helpful in attracting more people and making access to the conference more equitable. (Student participant) |

In light of all of the virtual things that all of us have been participating in for the last year… I think it would be really beneficial if all the presentations that were presented at the year’s previous conference were published online so that anyone that is going to conference next year has an understanding of what is possible and what is expected of them as a medical student and gives them some of those ideas of things that may not be numbers that usually are presented. (Student participant)

Maybe [we should be] thinking about how you could make the conferences – especially now that more people are comfortable with Zoom and virtual things – more accessible to students who might not have funding from their institution or otherwise to be able to go, to still be able to connect with other programs and other opportunities for mentors at different institutions. (Program leader)

noted that maintaining continuity required significant effort on their part: “It falls on the laps of the faculty to be the [program] champions.” Faculty attributed this challenge to yearly student leadership turnover at the preclinical-clinical transition, worsened by shortened preclinical schedules that accelerate the transition to mid-year. Mentees were equally aware of the threats to continuity, noting the constraints on participation that the clinical years created, including scheduling board exams around the annual conference and having reduced time to shadow once on clerkships. Such constraints interfered in actualizing the originally envisioned approach to flexible mentorship.

Additionally, mentees highlighted the predominance of academic psychiatry in their programs, which created a “homogenous population” of mentors, a challenge for students with CAP-related interests outside of academia: “As different as [the mentors] are, they’re very similar. They’re all academic child and adolescent psychiatrists, and it would be more beneficial to have other people who are from different career paths within CAP, because it can look very different.” This concentration raised questions about whether the MPNN effectively recruited students interested in a range of possible career directions.

Increasing Accessibility: Is the Annual Conference Possible for All Students?

A significant barrier to the MPNN’s effectiveness was the implicit messaging that research is required for conference attendance, blocking the “CAP-naïve” student population from gaining access to the NMSC and narrowing the profile of students able to access a networking resource to favor those oriented to academic psychiatry. This bias raised the question of equity in students’ access to the conference, especially for those less familiar with CAP from the start, such as first-generation medical students. “If you weren’t presenting research, there wasn’t necessarily a place for you,” remarked one mentee, with others noting that because of the predominance of research at prior conferences, presenting on non-research material, such as creative writing, advocacy, or clinical case presentations, required a greater degree of guidance into less-trodden territory. Moreover, these kinds of non-research opportunities were limited to more resource-rich schools “because they have the mentors who can support them in those presentations,” compared to institutions with less established or resourced CAP divisions, again highlighting concerns about equity and access. For several, this barrier stemmed from funding challenges: Resources for conference attendance were highly variable across institutions, with research as the one consistent “ticket” to the conference, guaranteeing full or partial funding, compared to students with no research to offer. “We don’t tell anybody that they can’t go. We just let them know that if you’re not an active presenter at the conference, then you’ll have to come up with your own monetary ways of getting there.” In this way, mentees identified research as a proxy for effort in their programs’ quest to
fairly distribute the limited funding available, inadvertently skewing the conference roster toward research:

It is much harder to track [a] road that hasn’t been paved, especially when you’re a first-year medical student trying to figure out, can you even present in the first place? It’s much easier to present on numbers because I have mentors who can tell me if I’m presenting on these numbers okay, versus [the message that] “it’s totally fine to present on whatever you want,” but you have to have someone helping you out doing it. No first-year is coming up with that on their own.

Mentors acknowledged mentees’ frustrations with the implicit requirement, agreeing that the conference’s purpose is “for you to learn more about child psychiatrists and network… not necessarily just to present.” Site leaders highlighted that there is a structure for transparent funding and commensurate protected time or advancement incentives for other faculty commitments like grants or committees: “If you’re going to sit on this grant, you’re going to get paid a certain amount; you’ve got to dedicate that amount of time.” Some hoped for “space to enforce a bit of a structure” into the site program’s leadership. Finding ways to integrate protected structure into the MPNN could broaden the resources available to the sites to support more students. Other leaders identified increased funding as necessary, less for matching protected faculty time than to enhance student conference support: “Unless there was significantly more money, paying ourselves 0.01% more is not going to make a difference. For that money, I’d rather buy one more ticket to take a student to [the conference].”

**A Path Forward: Toward a More Effective Subspecialty Mentorship Program**

In response to these critiques, participants offered an array of potential refinements to the subspecialty mentorship program. To improve the effectiveness of recruitment into CAP, some suggested incorporating more events into the clerkship year to reduce drop-off from clinical students, focusing on upper-year issues such as residency applications and heightened familiarity with triple board training. Students also hoped to cast a wider net for their peers by incorporating more patient-centered events, given preclinical students’ hunger for these types of experiences, and by working with curricular leaders to integrate CAP content into the general preclinical curriculum so that all students are exposed to CAP regardless of interest group involvement. Finally, post-graduate mentees hoped for continued programming at their training level to reduce attrition during adult psychiatry residencies.

To better fulfill the goal of flexible, sustained mentorship, participants sought structural solutions for the constraints on mentors’ availability. Rather than relying solely on faculty mentors, students suggested partnering lower- and upper-year students, or recruiting residents and fellows into the mentor list, noting that “sometimes it’s harder to connect with people that are further along in their careers.” Post-graduate mentees agreed, hoping for ways to stay involved in student mentorship beyond the occasional annual conference attendance. Mentees and mentors hoped for ways to protect faculty bandwidth and “feel confident that you have the time allocated to be able to implement the program,” musing about changes in funding, protected time, or “just creating a culture where faculty recognize how important this is.” To protect existing faculty involvement, mentors focused on increasing recognition of the program within their departments since it “does not come close to their radar.” Mentors suggested having program leadership write letters of appreciation to department chairs to raise awareness of the program and its requisite funding and protected time needs. “The chairs of the departments aren’t going to care about the money; we know that because it’s not enough. What they would care about is putting more medical students into psychiatry – that’s a feather in their cap for the department.”

To increase the accessibility of the annual conference and broaden the program’s focus beyond research and academic psychiatry, participants hoped for a recalibration of content to attract a more diverse student body and additional structural changes to increase opportunities during and beyond the annual conference. Everyone suggested de-emphasizing the research component of conferences, noting that “if one of the goals of [the MPNN] is to attract… a more diverse group of people to this field, I think we have to find a way where it’s easier for people who aren’t presenting research to come to the conference.” To this end, participants recommended re-emphasizing patients and communities during the conference, given that “what we have in common is an interest in these patients’ stories.” In order to increase accessibility for under-represented populations, mentors and mentees both hoped to allocate conference funding for first-generation or underrepresented medical students. Mentees also hoped for increasing conference funding in general, so that students with more clinical interests could also have a chance to attend conferences.

Beyond the conference, mentees asked for a broader scope of programming during the year, hoping to meet practitioners outside of academic psychiatry, noting that “it would be more beneficial to have other people who are from different career paths in CAP,” such as private practice and public health. Mentors acknowledged these concerns, agreeing that “we’re having research talks and bringing research people, and in some ways, we’re alienating more clinical folks.” To this end, mentors and mentees recommended utilizing their newfound facility with teleconferencing to break down institutional boundaries and create a “lending library” of mentors and
resources, “where we pool resources and each program has its constellation of strengths that we share,” allowing for a wider breadth of mentor experiences to reach students at various institutions. Evidenced by one recent Zoom iteration of the annual conference, necessitated by the COVID-19 pandemic, the virtual setting increased accessibility by minimizing travel and lodging costs and allowing for better attended and more diverse presentations: “Because it was virtual, money wasn’t really an issue. We opened it up to anyone in the med school that wanted to present.” Participants suggested extending the benefits of the virtual conference throughout the year by leveraging synchronous videoconferencing capabilities to increase peer-to-peer collaborations, host more network-wide events, and pair students with experienced faculty at other institutions. Incorporating virtual events broadens opportunities to engage in a global CAP mentorship network, such as with one institution that invited international students into their weekly events: “It’s been really fabulous having student representation from all over the world who have joined in for our weekly sessions. I’ve learned a ton from them, probably as much from the international students as I have from the patients and the class itself.” Faculty participants agreed, citing the recent success of the virtual conference, hoping to leverage virtual connections not just for international collaborations, but also for local network growth, such as bringing neighboring schools to the annual conference: “With the pandemic-Zoom experience on the one hand, and with the international experience on the other… these are things that were unimaginable. I think that there’s an opportunity here. The power that this could have at the national level, at the international level.”

Discussion

Several undersubscribed specialties have used medical student mentorship programs to boost recruitment, e.g., radiology [18], as reviewed in an analysis of similar networks in other specialties [19]. The network approach has also proven helpful in some areas of academic medicine [18]. For example, a federally funded network seeks to enhance the behavioral health workforce of rural communities by relying on exposure as early as high school, marshaling the power of near-peer guidance and role modeling [20]. In undergraduate medical education, psychiatry student interest groups (PSIGs) including PsychSIGN, an APA-supported network [21], have existed since at least 2010, but their reach and impact are unclear [22].

Several key components of mentorship programs are shared across specialties: early exposure, special interest groups, first-year summer experiences, research opportunities, or clinical shadowing can each be valuable in the preclinical years, as can sub-internships or elective rotations in the clinical years [23]. Most medical student mentorship studies have focused on mentee perspectives, revealing a preference for individual over group mentorship, emphasis on frequency of meetings, and efficacy of “facilitated exposures” over “pre-assigned” pairings [24]. Mentors have in turn identified challenges with time constraints and limited exposure of their specialty within the curriculum [25].

Apart from the MPNN, we are unaware of other medical student networks specific to child psychiatry. The network’s explicit goal is to increase recruitment into CAP, often through general psychiatry first. Two additional, less explicit goals include enhancing knowledge of child and adolescent mental health for students who match into non-psychiatry specialties [26], and creating a conduit toward building and maintaining a community of practice [27–30] for students who do join CAP.

Beyond elements common across specialties, we identified key points, suggestions, and challenges for a robust mentorship network (Table 3). Underlying these points are three “hooks” critical to the initiative’s success: (1) patient stories that capture students’ interest and curiosity about living experiences of young patients and their clinicians, allowing them to imagine themselves in CAP; (2) community, which nurtures a hunger for connection and belonging with likeminded trainees and faculty; and (3) an annual conference that serves as fertile ground in which to sow professional relationships, collaborations, and career paths.

Donald Kirkpatrick first posited a four-stage model to evaluate programmatic initiatives [31]. As applied to the MPNN, we have evidence for gains at each stage: (I) reactions, through improved perceptions and lower stigma about CAP [9]; (II) knowledge, through higher representation in the medical school curriculum [6]; (III) behavioral change; and (IV) institutional impact, reflected by documented increases in match rates into psychiatry [8], though not yet into CAP.

Beyond enhancing recruitment, medical student mentorship programs aim to reverse a decades-long decline in the training of clinician-scientists [32], a circumstance urgently relevant to CAP [33]. A review of 82 programs from different specialties documented an increase in research output and productivity related to early mentorship initiatives [19]. Retrospective cohort studies at single institutions, spanning a decade for radiation oncology [34] and 15 years for CAP [33], demonstrated increases in such “hard outcomes” as well as in federal funding. Apart from increases in output and productivity, mentorship programs have been shown to enhance wellbeing and decrease burnout among students, such as in emergency medicine [35].

Several participants commented on the limited range of interests, beyond research, explicitly incentivized by the MPNN. Surprisingly, although participants touched on the first-generation student population, they did not mention the diversity of other underrepresented students, including Black, Latino, and Native American. We are not the only ones to
share this concern. Limited access to professional guidance in general and mentorship opportunities specifically are limiting yet modifiable factors contributing to the “leaky pipeline” of minority recruits [36]. Enhancing social capital, as through opportunities offered by the MPNN, could help recognize, mobilize, and enhance social, professional, and mentorship links [37]. We concede that in this study, we did not specifically address the needs of underrepresented students.

Two additional limitations include, first, self-selection bias [38], with students more likely to pursue CAP opting to participate. Despite considerable outreach, we were unsurprisingly less successful in recruiting former participants who entered other specialties and whose input would have been invaluable to address areas for improvement. Second, our study could have benefited from a mixed-methods approach incorporating quantitative data. “Hard” outcome data such as those from an earlier MPNN report [8] will be increasingly important given the long “gestation period” and many “drop-off points” toward CAP. Long-term outcomes will inform cost-benefit analysis of the network’s return on investment. Social network analysis may provide additional insights, utilizing a small number of participants to determine how to optimize interpersonal connections [39].

In summary, our findings suggest that the MPNN’s unique constellation of early clinical exposure, community building, common mission, annual student conference, and high-quality mentorship affords a powerful blueprint for medical student engagement in CAP. This approach could be replicated or expanded, in whole or in part, to benefit other subspecialties.

Nearly two decades after its inception, the MPNN continues to generate enthusiasm from students and faculty for its ability to CAPtivate medical students: CAP mentorship matters.

Acknowledgements We appreciate the engaged participation of the Klingenstein Third Generation Foundation’s Medical Student Network sites and their leaders.

The authors have informed the journal that they agree that both Anita Kishore and Madeline DiGiovanni completed the intellectual and other work typical of the first author.

This research has been supported by QUALab, the Qualitative & Mixed Methods Lab, a collaboration between the Yale Child Study Center (New Haven, CT), and CESP, the Centre de recherche en Épidémiologie et Santé des Populations (Paris, France).

Funding Supported by an unrestricted grant from the Klingenstein Third Generation Foundation (KTGF); by the Riva Ariella Ritvo Endowment at the Child Study Center, Yale School of Medicine; and by NIMH R25 MH077823, “Research Education for Future Physician-Scientists in Child Psychiatry.”

Declarations

Ethics Approval Approved by the Stanford School of Medicine Human Subject Research Office (protocol # 59253).

Disclosures The KTGF had no role or input into the development of the study or the contents of this report.

AKo receives research support from AMO Pharma and consults to Ovid Therapeutics, Alkermes, Ritrova Therapeutics, Jaguar Therapeutics,
GW Pharmaceuticals, Neuren Pharmaceuticals, Clinilabs Drug Development Corporation, and SciBio Biosciences. All other authors have no conflicts to disclose.

References

1. American Academy of Child and Adolescent Psychiatry. AACAP Work Force Fact Sheet. Last updated March 2018. Available at https://www.aacap.org/App_Themes/AACAP/docs/resources_for_primary_care/workforce_issues/workforce_factsheet_updated_2018.pdf. Accessed 20 Apr 2020.

2. Chrisman N, Mohiuddin S. Addressing the nationwide shortage of child and adolescent psychiatrists: determining factors that influence the decision for psychiatry residents to pursue child and adolescent psychiatry training. Acad Psychiatry. 2022;46(1):18–24.

3. Agapoff JR, Tonal C, Eckert DM, Gavero G, Goebert DA. Challenges and perspectives to the rise in general psychiatry residency applications. Acad Psychiatry. 2018;42:674–6.

4. Findling R, Stepanova E. The workforce shortage of child and adolescent psychiatrists: is it time for a different approach? J Am Acad Child Adolesc Psychiatry. 2018;57:300–1.

5. Martin A. Ignition sequence: on mentorship. J Am Acad Child Adolesc Psychiatry. 2005;44:1225–9.

6. Martin A, Bloch M, Stubbe D, Pruett K, Belitsky R, Ebert M, et al. From too little too late to early and often: child psychiatry education during medical school (and before and after). Child Adolesc Psychiatr Clin N Am. 2007;16:17–43.

7. Stein JA, Althoff R, Anders T, Davison Y, Edwards S, Frosch E, Horst R, Hudziak JJ, Hunt J, Joshi SV, Kitts RL, Larson J, Leckman J, O’Brien J, Lowenhaus E, Pruitt D, Malloy E, Martin A, Partner A, et al. Does early mentorship in child and adolescent psychiatry make a difference? The Klingenstein Third-Generation Foundation Medical Student Fellowship Program. Acad Psychiatry. 2013;37:321–4.

8. Himmelstein R, Guth S, Enenbach M, Margaret M, Stevens H, Kolevzon A, et al. Psychiatry match rates increase after exposure to a medical student mentorship program: a multisite retrospective cohort analysis. Acad Psychiatry. 2020;46:40–4.

9. Kishore A, Sun K, Guth S, Kolevzon A, Martin A. Child and adolescent psychiatry perceptions and career preference: participation in a national medical student conference improves outcomes. J Am Acad Child Adolesc Psychiatry. 2020;59:3–7.

10. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006;3:77–101.

11. Kiger ME, Varpio L. Thematic analysis of qualitative data: AMEE Guide No. 131. Med Teach. 2020;42(8):846–54. Available from. https://doi.org/10.1080/0142159X.2020.1755030.

12. Larkin M, Thompson A. Interpretative phenomenological analysis. Qualitative research methods in mental health and psychotherapy: a guide for students and practitioners. 2012;28:99–116.

13. Smith J, Flowers P, Larkin M. Interpretative phenomenological analysis: theory, research, practice. London: SAGE; 2009.

14. Saunders B, Sim J, Kingstone T, Baker S, Waterfield J, Bartlam B, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. Qual Quant. 2018;52:1893–907.

15. Creswell J, Klassen AC, Plano V, Smith KC. Best practices for mixed methods research in the health sciences. Methods. 2011;29:1–39.

16. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. Int J Qual Health Care. 2007;19:349–57.

17. Bergold J, Thomas S. Participatory research methods: a methodological approach in motion. Hist Soc Res. 2012;37:191–222.

18. Kostrubia DE, Kwon M, Lee J, Flug JA, Hoffmann JC, Mohiri M, et al. Mentorship in radiology. Curr Probl Diagn Radiol [Internet]. Elsevier; 2017;46:385–90. Available from: https://doi.org/10.1067/j.cpradiol.2017.02.008

19. Nimmons D, Giny S, Rosenthal J. Medical student mentoring programs: current insights. Adv Med Educ Pract. 2019;10:113–23.

20. Keeler H, Sjuts T, Nitsiu K, Watanabe-Galloway S, Mackie PFE, Liu H. Virtual mentorship network to address the rural shortage of mental health providers. Am J Prev Med [Internet]. Elsevier Inc.; 2018;54(6 Suppl 3):S290–S295. Available from: https://doi.org/10.1016/j.amepre.2018.02.001

21. Psychiatry Student Interest Group Network. Psych SIGN [Internet]. [cited 2022 Apr 20]. Available from: http://www.psychsign.org. Accessed 20 Apr 2022.

22. Reardon CL, Dottl S, Krahn D. Psychiatry student interest groups: what they are and what they could be. Acad Psychiatry [Internet]. 2013;37:175–8. Available from: https://doi.org/10.1176/appi.ap. 11100190

23. Lubelski D, Xiao R, Mukherjee D, Ashley WW, Witham T, Brem H, Huang J, Wolfe SQ. Improving medical student recruitment to neurosurgery. J Neurosurg. 2020;133:848–54.

24. Barker JC, Rendon J, Janis JE. Medical student mentorship in plastic surgery: the mentee’s perspective. Plast Reconstr Surg. 2016;137:1934–42.

25. Janis JE, Barker JC. Medical student mentorship in plastic surgery: the mentor’s perspective. Plast Reconstr Surg. 2016;138:3525–35.

26. Fox GS, Stock S, Briscoe GW, Beck GL, Horton R, Hunt JI, Liu HY, Partner Rutter A, Sexson S, Schlozman SC, Stubbe DE, Stuber ML. Improving child and adolescent psychiatry education for medical students: an inter-organizational collaborative action plan. Acad Psychiatry. 2012;36:461–4.

27. de Carvalho-Filho MA, Tio RA, Steiner Y. Twelve tips for implementing a community of practice for faculty development. Med Teach. 2020;42(2):143–9.

28. Cruess RL, Cruess SR, Steiner Y. Medicine as a community of practice: implications for medical education. Acad Med. 2018;93:185–91.

29. Wenger E. Communities of practice: learning, meaning, and identity. Cambridge: Cambridge University Press; 1998.

30. Wenger E. Communities of practice and social learning systems. Organization. 2000;7:225–46.

31. Kirkpatrick D. Great ideas revisited. Techniques for evaluating training programs. Revisiting Kirkpatrick’s four level model. Train Dev. 1996;50:54–9.

32. Rosenberg L. Physician-scientists—endangered and essential. Science. 1999;283(5400):331–2. Available from. https://doi.org/10.1126/science.283.5400.331

33. Calhoun A, Bloch MH, Stubbe D, Leckman JF, Martin A. Integrating clinical and research training in child psychiatry: fifteen-year outcomes of a federally supported program. Child Adolesc Psychiatric Ment Health BioMed Central. 2020;14:1–10.

34. Hirsch AE, Agarwal A, Rand AE, DeNunzio NJ, Patel KR, Truong MT, et al. Medical student mentorship in radiation oncology at a single academic institution: a 10-year analysis. Pract Radiat Oncol. 2015;5(3):e163–8. Available from. https://doi.org/10.1016/j.prro.2014.08.005

35. Jordan J, Watcha D, Cassella C, Kaji AH, Trivedi S. Impact of a mentorship program on medical student burnout. AEM Educ Train. 2019;5(3):e163

36. Freeman BK, Landry A, Trevino R, Grande D, Shea JA. Understanding the leaky pipeline: perceived barriers to pursuing a career in medicine or dentistry among underrepresented-in-medicine undergraduate students. Acad Med. 2016;91:987–93.

37. Nicholson S, Cleland JA. “It’s making contacts”: notions of social capital and implications for widening access to medical education. Adv Health Sci Educ. 2017;22:477–90.
38. Harber KD, Zimbardo PG, Boyd JN. Participant self-selection biases as a function of individual differences in time perspective. Basic Appl Soc Psychol. 2003;25:255–64. Available from. https://doi.org/10.1207/S15324834BASP2503_08.

39. Petrescu-Prahova M, Belza B, Leith K, Allen P, Coe NB, Anderson LA. Using social network analysis to assess mentorship and collaboration in a public health network. Prev Chronic Dis. 2015;12:1–10.

**Publisher’s Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.