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The ways social networks shape reflection on early significant clinical experiences in medical school

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Article abstract

Background: Medical curricula are increasingly providing opportunities to guide reflection for medical students. However, educational approaches are often limited to formalized classroom initiatives where reflection is prescriptive and measurable. There is paucity of literature that explores the personal ways students may experience authentic reflection outside of curricular time. The purpose of this study was to understand how social networks might shape dimensions of reflection.

Methods: This study employed a qualitative social network analysis approach with a core sample of seven first year undergraduate medical students who described their relationships with 61 individuals in their networks. Data consisted of participant generated sociograms and individual semi-structured interviews.

Results: Many learners struggled to find significant ways to involve their social networks outside of medicine in their new educational experiences. It appeared that some medical students began in-grouping, becoming more socially exclusive. Interestingly, participants emphasized how curricular opportunities such as reflective portfolio sessions were useful for capturing a diversity of perspectives.

Conclusions: Our study is one of the first to characterize the social networks inside and outside of medical school that students utilize to discuss and reflect on early significant clinical experiences. Recent commentary in the literature has suggested reflection is diverse and personal in nature and our study offers empirical evidence to demonstrate this. Our insights emphasize the importance of moving from an instrumental approach to an authentic socially situated approach if we wish to cultivate reflective lifelong learning.

Canadian Medical Education Journal

Original Research

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Comment les réseaux sociaux façonnent-ils la réflexion des étudiants en médecine à l'égard de leurs premières expériences cliniques significatives?

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Abstract

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Résumé

Contexte : Les cursus d'études en médecine offrent de plus en plus d'occasions de guider la réflexion des étudiants. Cependant, les approches pédagogiques se limitent souvent à des initiatives formelles en classe où la réflexion est obligatoire et évaluée. Il y a peu d'études scientifiques sur la réflexion personnelle et authentique des étudiants en dehors des cours. Cet article vise à explorer comment les réseaux sociaux peuvent façonner des dimensions de la réflexion.

Méthodes : Cette étude est fondée sur une approche qualitative d'analyse des réseaux sociaux avec un échantillon de base de sept étudiants en première année de médecine qui ont décrit leurs relations avec 61 personnes issues de leurs réseaux. Les données sont constituées de sociogrammes créés par les participants et d'entretiens individuels semi-structurés.

Résultats : De nombreux apprenants ont eu du mal à trouver une manière de partager leurs nouvelles expériences éducatives de façon significative avec leurs réseaux sociaux extérieurs à la médecine. Le fait que les participants soulignent l'utilité des occasions qu'offre leur programme, comme les séances de réflexion sur le portfolio, pour accéder à une diversité de perspectives est également intéressant à noter.

Conclusions : Notre étude est l'une des premières à analyser l'utilisation que font les étudiants en médecine de réseaux sociaux tant l'intérieur qu'à l'extérieur de la faculté pour soutenir leur réflexion sur leurs premières expériences cliniques importantes et pour en discuter. Des publications scientifiques récentes suggèrent que ces réflexions sont personnelles et diversifiées et notre étude en apporte la preuve empirique. Nos observations soulignent l'importance de passer d'une approche instrumentale à une approche authentique et socialement située si nous souhaitons cultiver un apprentissage réflexif tout au long de la vie.

Introduction

The power of reflection

Reflection is a valued practice in medical education.[1] Reflection is described as structuring and integrating an experience or knowledge to conceptualize it with a novel perspective, raising awareness of sociocultural power relationships or creating new action.[2–4] The practice of reflection is known to challenge beliefs and assumptions to facilitate transformative learning in the context of medical school and into one's career.[5–9] In particular, reflection can occur after meaningful or significant experiences and stimulates medical students to understand 'why things are the way they are.'[10–13]

Authentic reflection can be difficult to both capture and implement in a curriculum.[14–19] Despite this, medical curricula are creating initiatives to guide reflection. For example, reflective portfolios are being widely applied as an educational structure for encouraging formalized reflection on experiences.[10,12,14] Some argue these initiatives assess prescribed steps using checkboxes that may not impact future meaningful acts of reflection that can improve one's medical practice.[2,6,14–16,20,21] Others caution a tendency to promote 'zombie reflection'—the act of simply unconsciously going through the motions of reflection.[14,20] In response to these critiques, there is a call to both embrace and teach diverse and authentic methods of reflection.[14] Despite the call for initiatives that stimulate authentic meaningful reflection,[14] we lack empirical evidence that demonstrates the personal ways students may experience reflection as a social phenomenon.[13]

The role of social networks

While traditionally described as an individual cognitive process, there is growing appreciation for the contributions that social relationships can offer in how we understand reflection.[7,20,22] We know that meaning is often co-constructed and interpreted through communication with others.[23] With increasing medical student diversity, and thus complex social identities, it is imperative that we understand the ways social networks both inside and outside of medical school stimulate and support reflection of early clinical experiences.[24] To deepen our understanding of the social dimensions of reflection, our research question was: how do medical students' social networks shape reflections on early significant experiences?

Methods

The study employed a qualitative social network analysis approach to explore social life. This approach to research is emerging in medical education.[25–27] Social network analysis is a paradigmatic approach that emphasizes how society is the product of relational intersections, thus deflecting attention away from individuals as isolated actors.[28–31] A social network approach aligns with our research question as it assumes connectedness and dependency between interlinked individuals and examines the qualitative interplay of identity and meaning within social relations.[26,29,31]

Setting and subjects

This study was conducted at a large Canadian medical school distributed across four regional campuses. In Canada, students enter a 3-4 year medical degree program following their undergraduate studies. Recruitment occurred within the 288-student first year cohort by email. The composition of this cohort was 45% female, 54% male and <1% non-binary with a mean age of 23.9 years.[32] Participation was voluntary and all students who responded were invited to participate.

Seven students participated in this in-depth exploratory study; each participant described on-average nine individuals they interacted with regarding significant experiences, representing a total of 61 social network relationships. The genders and ages of the core participants were representative of the first-year class.[32] We deemed the sample size had sufficient information power based on the specific research question we asked, the richness of dialogue, and our use of theory to analyze and interpret the two data sources.[33,34]

The interviews took place during the latter half of the students' first year of study. Students in this setting have multiple opportunities for clinical experiences in year one, including family medicine community office visits, clinical skills sessions, and extra-curricular physician shadowing experiences. The students also participate in a mandatory reflective portfolio program that involves groups of eight students who meet 3-4 times per year to reflect on clinical experiences guided by a faculty coach.

Data generation: social network sociograms

We employed a qualitative ego social network analysis approach that included both participant generated sociograms (a visual representation of their social network), and semi-structured interviews.[27,31,35,36]

Sociograms enabled participants to 'show' the interviewer their social contexts and express their thoughts in ways that increased mutual understanding.[37]

Prior to the interview, participants completed a social network survey, asking them to list members of their network, such as family, friends, partners and colleagues, with whom they discussed a specific early clinical experience.[38] We asked participants to recall a recent personally significant clinical experience that would incite this type of memory recollection.[13]

During the interview, participants were shown an example sociogram (i.e. ego network) to guide the creation of their own sociogram (Appendix A).[36] Participants were then asked to use the data from their survey to build their own sociogram using a white board, markers and circles of different sizes to represent relationships. These participant-generated sociograms were used to stimulate probing questions during the semi-structured individual interviews.[38] The participants were able to modify the sociograms during the interview if they deemed it necessary. At the end of each interview SS took a photo of the whiteboard of participants' ego networks and later referenced these images during analysis of data.

Individual interviews

In-person, semi-structured interviews were audio-recorded and transcribed verbatim. Interview questions explored the composition of students' social networks , the value they place on each relationship, and the utilization of these networks to foster reflection of early significant clinical experiences.[39,40]

Data analysis

The authors engaged in several stages of thematic analysis, first deriving codes from quotations of interest and subsequently considering common themes that allowed for grouping of the data.[41] Codes originated from ideas and quotations that were surprising, repetitive, highlighted as important by the participant themselves or reminiscent of other ideas from the literature.[41] All authors undertook a constant comparative approach within and between transcripts to detect different concepts and ways of understanding from each participant in order to develop themes from the codes.[42] Throughout this iterative analysis the researchers shared their analytic notes.[43,44] Sociograms were referenced repeatedly during the analysis to add breadth to the interview data[31,35,45,46] and to enhance depth of understanding.[33] Moreover, concurrently analyzing the two data sets enhanced rigour through comprehensiveness rather than convergence. This analytic approach afforded crystallization as it provided a multifaceted richly complex understanding of our research question.[33]

Social identity theory was integrated into the latter stages of analysis to deepen our understanding of our emerging insights. We drew on specific dimensions of this theory, including both social mobility (changing identity as various group membership changes) and social change (making oneself more, or less, appropriate to an in-group)[47,48] to enhance conceptual depth of understanding. Thematic sufficiency was obtained when a robust and comprehensive understanding of the research question was reached.[33,34]

SS performed the interviews; their own lived experience of medical school informed context and elicited participant trust.[49] They were aware of their own experiential knowledge and reflexively engaged with their expectations, assumptions, and surprises after coding and reflecting on each interview.[50] MH is a practicing family physician, qualitative researcher and curriculum developer and LN a social scientist. All authors provided insights that corroborated and expanded interpretation of data.

Ethics approval was obtained from the University of British Columbia's Behavioural Research Ethics Board as a minimal risk study. Certificate H17-02714-A002. Work was carried out in accordance with the Declaration of Helsinki, including, but not limited to, there being no potential harm to participants, that the anonymity of participants was guaranteed, and that informed consent of participants was obtained. To enhance transparency of reporting, we employed SRQR recommendations.[51]

Results

Discussions around early clinical experiences and network composition

Learners were asked to think about a significant clinical experience that prompted them to reflect with others in their network. These incidents often invoked strong emotions and ranged from: 'first' experiences (such as the first time being in the operating room), encounters with role models, religious incongruities, and confronting racism in the workplace.

Interestingly, each learner began their sociogram by drawing their immediate family proximal and often interconnected: parents, siblings, and partners. Participants then expanded their drawing to include their

classmates, community preceptors, portfolio coaches, and occasionally friends outside of medicine. A few participant sociograms included individuals such as roommates or acquaintances. The medical student groups were frequently depicted as interconnected; learners described rapid relationship building with their medical peers.

Figures 1-3 are examples of participant generated sociograms created during the interview.

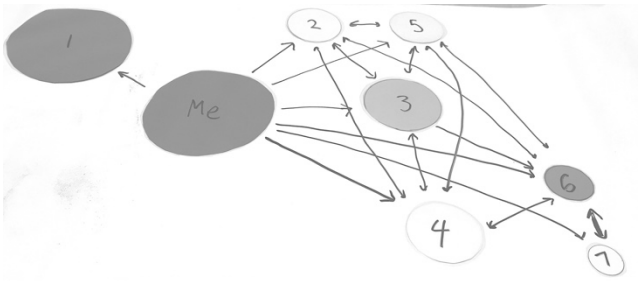

Figure 1. Example sociogram

Medical student A. Learners were asked to use proximity in space to describe their relationship closeness, with those "nearer" to the participant visually also being socially "closer". Size of the icons to represent the individuals was symbolic of the weight or value students placed on their opinions, with those most highly valued by the student being the largest. Learners were asked to connect any individuals whom had interacted with each other in any capacity with arrows. This learner situated themselves in the middle. Their mother, 1, is to the left. 2-6 represented classmates. 7 is an acquaintance from outside medical school that the learner happened to ski with.

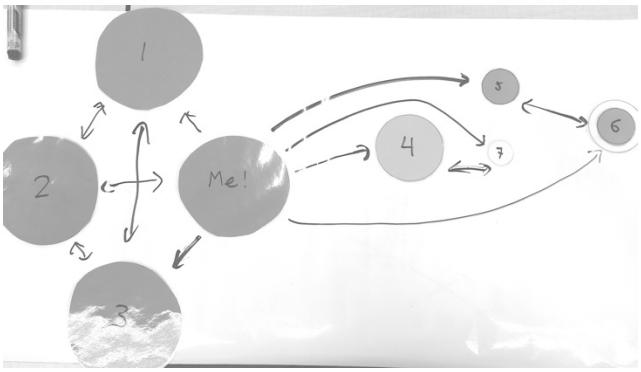

Figure 2. Example sociogram

Medical student C. 1-3 central figures (on the left) is typical, including parents and siblings, and they tend to be the largest and nearest, demonstrating the weight given to their value of opinion and closeness. 5 is the community preceptor, 6 is a colleague of the preceptor. 4 represents seven classmates in a reflective portfolio group, as one collective. 7 represents the portfolio coach, a faculty member. There is an additional circle around 6 as the learner realized during the interview that they actually valued this preceptor more than they initially thought, because of a shared ability to relate to the encounter.

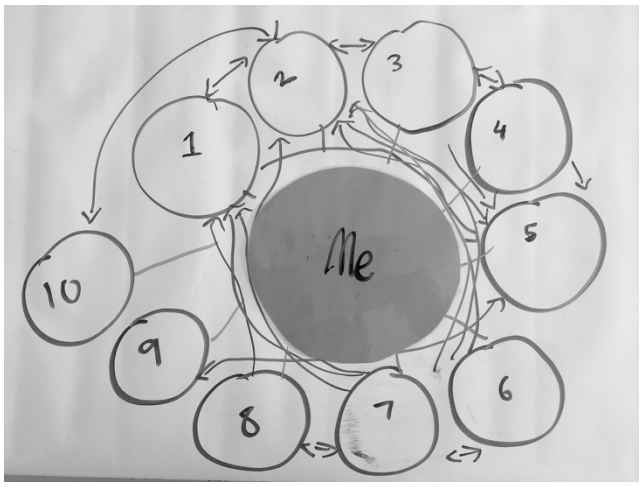

Figure 3. Example sociogram.

Medical student E. 1-2 represent this learner's parents. This participant belonged to a tight-knit community with the most homogeneity amongst valuing opinions, visually depicted by equal sized circles, but ultimately describes her parents, 1 & 2, as having the highest weight with the nearest proximity, in line with other sociograms. This was notably the only learner who had no medical students in their sociogram, but did include three "family-like" friends who worked in health care fields. The rest of the individuals in this sociogram are from the learner's extended family. The participant, in fact, stated that 10 spaces were not enough, and if possible, their network would be much larger if they had the space to accurately represent whom they discussed the event with.

Learners occasionally described including people in their network who, through discussion and reflection, might change their behaviour and future approaches to significant clinical experiences. Several learners described purposeful inclusion of mentors and peers whose professional character they admired as part of this network:

> *… the reason why I've chosen these five people specifically is…because they're… academically inclined and brilliant-- like much smarter than I am. But also because they have a lot of insight into how they are and the path that they want to take in terms of … medicine or medical careers in the future. And they're also people who care very much for their peers. (Medical student D)*

Others sought those in the network who have had similar clinical experiences. Some participants also described common ethnic backgrounds or similar ages as important because of the shared lived experience through this common social identity:

> *We both have a [ethnicity] background and so in a way it was a bit easier to talk to her about the feelings that I was having. Just because, like, it's easy to relate to because she's gone through similar things. (Medical student C)*

Learners respected the explicit messaging that reflection is important by having it embedded in curricular time during portfolio sessions. The portfolio group was sometimes included on learners' sociograms, and learners appreciated the diversity in perspectives these groups provided: *"And I think portfolio allows you to hear experiences outside of those intimate networks that you make." (Medical student H)*

One student intentionally sought out the patient perspective for a diversity of ideas:

> *I think there's something about knowing that this person seems to represent the lay population to me. And I think there's something really valuable about knowing what their experience is like and how different it is from what I'm learning in class. And because it's so different I almost view it as, I mean, I've drawn it [on the sociogram] quite a bit smaller than number one, but I almost view it as just as important. (Medical student B).*

Oftentimes, individuals were included in the sociogram because they were available for timely communication. For example, learners reached out to acquaintances or roommates in happenstance because they were physically proximal in that moment, rather than purposefully seeking their perspectives or viewpoints.

Curating discussions in network interactions

Learners described sharing early significant experiences as a mechanism to build relational closeness without necessarily aiming to reflect. Most participants described that they had to purposefully engage their family by carefully curating the way they share their workplace experiences. In some cases, they were not seeking support nor opinions, but rather, strategically sharing their experiences in order to keep their loved ones involved in their lives:

> *And to try to tell [my mother] everything that is exciting that's going on and everything that I'm happy about. And sort of help her share a bit of the excitement and joy of what-- the process I'm going through now. So that is where we've kind of settled on recently …very much one-directional, me sort of sharing what's going on, trying to let her … be a part of my life, in a sense. (Medical student A)*

Alternatively, some learners described that they don't want to 'bore' those outside of medicine with details of their experiences. Interestingly, others described deliberately excluding people from their sharing of early clinical encounters to 'preserve' their outside network and others' impression of them.

> *Something I've really struggled with in medical school is wanting to have a life outside of medicine. So I feel like sometimes, I actually keep the things that I'm excited about in 'cause I don't want to … always be the guy who goes on and on about medicine … especially with people who aren't in medical school. (Medical student G)*

Some learners described how conversations about early significant clinical experiences with those who are not in medicine can be frustrating and unsatisfactory. Sometimes, the reactions of those outside of medicine were inappropriate and unhelpful to the learner such as laughing at situations the learner finds concerning or serious, or devaluing the significance of the event. There was reference to inherent conversational barriers that emerged because of being in a high status 'profession' and the dynamics between themselves and those not in medicine:

> *'Cause I've always been kind of that professional role and then there is that… kind of power differential that… people not in professional roles might not understand exactly or might not feel. (Medical student C)*

Some other learners felt the scenarios were too medically complex to describe to lay people. Without being able to overcome this initial conversational obstacle, they found they were unable to engage in meaningful reflection with these outsiders:

> *…it takes me a really long time to explain these situations. And oftentimes it's so foreign to some people that it's hard for them to offer that support and also I don't want to subject them to feeling like they have to try to understand [the encounter] to offer that support. (Medical student G)*

During the study interview, some participants realized that they may actually find less value in discussions with individuals than they initially thought when they first created the sociogram. In a few instances, participants modified their sociograms, during the interview by changing the size of the circles that represented the importance of the perspective of that individual: "*…through our talk I'm wondering… if my spouse [circle] should be so big" (Medical student H).*

Portfolio groups were both included and other times excluded when describing social network interactions, depending on perceived value. Some individuals did not find prescribed reflection to be of high personal value. Learners describe the infrequency of contact and superficial relationships sometimes formed in these groups to make authentic reflection seem difficult, particularly with guided topics that can prohibit spontaneity in discussion.

The functions of social networks

Learners elaborated on the importance of sharing their lived experiences with their social network ties:

> *I guess the whole practice of medical school, and hopefully medicine in general for me, I don't want it to be a solitary practice. I think there's a certain aspect of self-improvement and self-discovery…for me that's very much tied to sort of the people around me and those relationships. (Medical student A)*

For many, emotional support arose in their network relations: "*Because it's true that I put a lot of weight into what other people or other women say. Just because I know that they can empathize in that unique way" (Medical student H).*

Social networks were also a space to share excitement or a specific experience of learning:

> *So me bringing it up with other people was just kind of me having an outlet to share something that I was excited about. And I feel like that was just reflected back to me. So in that sense I don't think it really altered too much of how I interpreted it. ... Where I think, like, more the negative experiences … are more up for discussion in terms of what I get out of those discussions. (Medical student G)*

Networks seemed to also help to orient a learner to a new role or guide them towards interests: "*I want your input and what would you have done? And I am not only looking for emotional support but also advice and also to learn" (Medical student B).*

For others, the reinforcement of ethical principles from other individuals was of utmost importance.

> *And probably more so the people in the medical program, because I find that they have really good insight on-- and, you know, things that I already know to be true. But it's more of like reinforcing talk about, you know, this is the proper thing to do in this situation. And talk about ethics and things that really pertain to everyday encounters with patients and difficult situations. (Medical student H)*

Some participants wanted their network discussions to reveal their hidden biases and help guide them to utilize reflection as a mechanism to enhance self-discovery and self-improvement:

> *So, I mean, the way that I've talked about this particular clinical experience with each of these people in turn, then shapes not only how I think about that clinical experience. But even how I remember that clinical experience and how I'm going to think about it going forward. So yeah, without a doubt. And I think sometimes I try to purposely talk about things with one person or another in order to help make sure that the way things go in the future are in line with how I want them to go. (Medical student B)*

Interestingly, participants didn't always need their network to 'do anything'. Having the opportunity to vocalize their experience allowed them a means to reflect on and consolidate their memories without external influences or contributions. Sometimes discussions were purposefully intended to simply have others listen and bear-witness to their lived experience: *"[It is] less about getting advice or me giving advice" (Medical student B).*

Discussion

This study was uniquely able to capture social network interactions that stimulate medical students' reflections early in their training. Social identity theory drew our attention to the social complexities that arise when transitioning in the early years of medical school including isolation both spatially and socially.[48,52,53] We observed many participants beginning to struggle to communicate and share experiences with those outside of medicine related to power and status attributed to being a medical student, the use of medical jargon, and others' lack of contextual understanding. A salient insight that emerged was the in-grouping of participants (See Figures 1 and 2). This is visualized in the 'us' and 'them' nature of the sociograms, and the rich narrative descriptions of inclusion and exclusion in network interactions around early significant experiences. The literature has previously described how similarities in race, ethnicity, age and gender can either segregate or create ties in work and friendships.[54] Social exclusivity in medical students has been found to have some unfavorable effects such as diminishing future professionalism, prejudice and

discriminatory behaviour, decreased flexibility with changing roles in teams, and diminished self-complexity (a sense of belonging to different groups) leading to lower resiliency.[52,55,56] Our findings suggest that some students are aware that their own networks were becoming more socially exclusive, while others became aware when creating their sociograms in this study. Notably, a few participants articulated value in diversity of opinion early in training and purposefully sought to maintain outside interactions. We think this can be a key to avoiding an echo-chamber phenomenon, which is described as idea reinforcement with a paucity of new ideas.[6,7,52] The insights suggest that students may need to purposefully maintain broad perspectives and inclusive social attitudes to communicate with diverse patients and colleagues.

Although we sought to understand how first year medical students engage with those in their social networks around significant clinical experiences, they spontaneously spoke of the broad function of social network ties. Learners appeared to utilize their networks in multifaceted ways: to seek support; build reciprocal genuine relationships; foster empathy for their own experience; and even receive guidance on aptitudes. Though many of these acts center around the act of reflection, students often failed to notice it as such.

Participants suggested that curricular interventions, such as reflective portfolio groups can be enriching because of the unique diversity these randomly assigned groups can bring. However, some felt there were barriers in these curricular spaces in terms of fostering authentic and vulnerable conversations. Moreover, participants critiqued rigid prescribed topics, infrequency of meetings, and superficial relationships. It thus seems important to consider how we can best encourage students to optimize their networks in all domains of social life for support, reflection, and co-construction of meaning around early personally significant encounters.[57]

We propose that students may be able to create sociograms and raise awareness about the ways they use, or do not use, their social networks to challenge and change assumptions, thus fostering critical reflection.[1,15] Learners may be underutilizing their social networks to engage in dialogue and seek diverse perspectives. Practicing critical reflection on the composition of one's social network during early significant clinical experiences is one potential curricular intervention to assist students in actively employing diverse and purposeful network connections.[4,13] In this study, participants represented how social network ties can be a form of social support[27,30]– through discussion, reassurance, guiding, advice, and even listening. This insight signals the power of social relations in stimulating reflection. Reflection is more effective when multiple sources and perspectives are included.[7,19] We concur with de la Croix and Veen that diversity in reflection needs to be appreciated,[14] and that personal ways of reflecting, both inside and outside of the curriculum, should be accepted in medical school. Moreover, formal curricular opportunities with a diverse group of classmates may be essential for some students to gain exposure to differing experience, perspectives, and beliefs. Students who are able to identify with perspectives outside of themselves and their profession are found to better foster social inclusive attitudes and build empathy to relate to patients.[58,59] The literature is beginning to explore the role of socialization and networking outside of the classroom.[60] Our insights build on recent research by demonstrating how social networks outside of the medical school classroom can foster nuanced reflection. By focusing on *reflective process* rather than outcomes of reflection in medical school, educators will be better able to support the social phenomenon of reflection.

Future directions

Our study vividly demonstrates the ways social influences shape reflection in medical education. This work expands the literature that recognizes there are many dimensions that shape reflection, such as personal and experiential knowledge, mentorship, and environment.[4,10,14,17,18] To enhance insights, longitudinally exploring the network composition starting from early-years students until the end of training with a focus on reflection would be worthwhile. Moreover, in depth studies exploring the interrelationship between network composition and professional identity formation are of interest. The task for students to build and maintain a broad social network to enrich their perspective should not be placed solely on the individual as it obscures institutional responsibility. At an institutional level, it may stimulate a medical school to introduce curricular derived reflection sessions with diverse student composition. This ensures that all students gain exposure to differing experience, perspectives, and beliefs by intentionally creating opportunities for critical reflection.

Limitations

A study limitation is the availability of specific data on identity both from the classroom cohort and in our study.[32] We suspect that other dimensions of identity outside of

age and gender play an integral role in social network interactions, and shape meaning making and subsequent identity development. This is an underrepresented area that deserves exploration in future research. Given the exploratory nature of this study, we are mindful to not draw broad universal inferences regarding the nature of reflection in first year medical school in our program, much less other medical programs in other curricular contexts. Future research confirming and expanding our findings in other contexts is needed.

Conclusion

This study clearly demonstrates how early medical students utilize their social networks to discuss and reflect on early clinical encounters and the role that outside social networks play on these students' perceptions, experiences, and behaviours. We suggest a network awareness can be fostered through learners' mapping and critically analyzing their network relationships. The insights add to a growing body of literature demonstrating the importance of meaningful authentic reflection. This work brings an important contribution to the literature that highlights how social network dynamics shape reflection as students transition socially and form their identity as physicians. The insights point to authentic reflection as a networked activity, and we highlight ways for medical educators to support this social phenomenon.

Conflicts of Interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Example sociogram