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COMMENTARY

How to Identify Medical Students at Risk of Academic Failure and Help Them Succeed? An Interview with a Medical Educator

Savithiri Ratnapalan [1,2,3] · Anna Jarvis [1,3]

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Introduction

Medical school admission is a rigorous and resource-intensive process in North America as both students and medical schools invest considerable effort, time, and money on the admission process. Medical school Admissions Committees aim to ensure the students selected have the cognitive and emotional capacity to handle medical school. As a result, high undergraduate grade point averages and excellent grades in standardized tests such as the Medical School Admission Test (MCAT) are required for admission in North America. In addition, there has been a proliferation of psychometric evaluations and mini mental tests as part of the interview process to ensure academic success in medical schools [1, 2].

The cost of medical education in the United States (US) was estimated to be US$40,000–50,000 per student, per year in 1997 and is probably higher 20 years later [3]. At present, about 82.5% of US medical students complete the requirement for graduation in 4 years and 97% complete in 8 years with an attrition rate of 3% [4]. In a survey, 11% of the 2222 medical students indicated that they have serious thoughts of dropping out of medical school each year [5]. A systematic review identified high prevalence of depression and anxiety among medical students, and concluded that the overall psychological distress is higher in medicals students compared with the general population [6].

✉ Savithiri Ratnapalan
savithiri.ratnapalan@sickkids.ca

[1] Department of Paediatrics, University of Toronto, Toronto, Canada

[2] Dalla Lana School of Public Health, University of Toronto, Toronto, Canada

[3] Divisions of Emergency Medicine, Hospital for Sick Children, 555 University Avenue, Toronto, Ontario M5G 1X8, Canada

Educational researchers have attempted to develop strategies to identify students at risk of academic failure using undergraduate grade point averages, MCAT scores and other demographic and socioeconomic factors of medical students to predict academic success and failure [7–10]. There have been toolkits developed to identify students at risk of failure using the following criteria: failure of 3 or more examinations per year, an overall average of < 50%, health or social difficulties, failure to complete Hepatitis B vaccination on time, and remarks noted about poor attitude or behavior [11]. A qualitative study of seven medical students who had failed the final examination has indicated that medical students are usually unaware of their risk of academic failure and concluded that the onus should be on teachers to identify students at risk during their formative assessments [12]. The literature on identification of students at risk of academic failure is limited.

The primary author has participated in student remediation throughout her career. The Faculty of Medicine provided student support services as did the university. The primary author (SR) interviewed a Professor Emerita (AJ) to explore her experiences and views to understand how educators identify students at risk of academic failure, assist, and support them. The second author (AJ) was the Associate Dean of Health Professions, Student Affairs in the Faculty of Medicine at the University from 2001 until 2009, in addition to being a medical educator for over three decades. The medical school both educators worked in was founded in 1843 and admits 260 students per annum for its 4-year Medical Doctor (MD) program. The interview was digitally recorded, transcribed verbatim, and analyzed by both authors. The main approaches to the analysis were meaning condensation, categorization, interpretation, and narrative structuring to provide a coherent story [13].

Authors' views are discussed under five themes as follows: (1) competencies needed for academic success in medical schools, (2) reasons for academic failure, (3) identification

of students at risk of academic failure, (4) the role of the medical school in reducing academic failures, and (5) the role of medical teachers in ensuring academic success.

1. Competencies needed for academic success in medical schools. Medical students are selected based on their high academic achievements but the high performance prior to admission does not guarantee global competency that is expected in medical school. "In medicine students are judged on global performance." Please see Fig. 1 for expected competencies for medical students. The pre-clinical and clinical progress committees have a responsibility to identify students who struggle early.

You can assume that any one of our students who comes in after a first degree is brilliant and is used to getting top marks. If they are getting a comfortable pass that is an under performance! *In my experience if there is a difference of two standard deviations between a student's performance in straight memory work, communication, interpersonal skills, tutorial group cooperative studies or technical skills, they need help. I don't mean a full $4000 work up, but they need some advice in studying.*

2. Reasons for academic failure. Academic performance of medical students is influenced by an interplay of inherent individual student factors, the environmental interactions of the student, and the social or financial support available to the student from family peers, society, teachers, and the university. Please see Table 1 for some of the quotes that highlight reasons for academic failure.

Academic failure can be due to compromise of one or more components of competency such as keeping up with knowledge, optimal interpersonal, and communication skills or mastery of technical skills. Students' behaviors, social skills, and life skills play an important role in academic success in medical school. Students' psychoeducational attributes and unrecognized learning difficulties also contribute to academic failure. Students identified as having a learning challenge prior to medical school do very well.

Some of this comes down to economics, Some students came in with letters that clearly stated they had been assessed by private educational psychologists and that they were entitled to accommodations which they received from the get go.

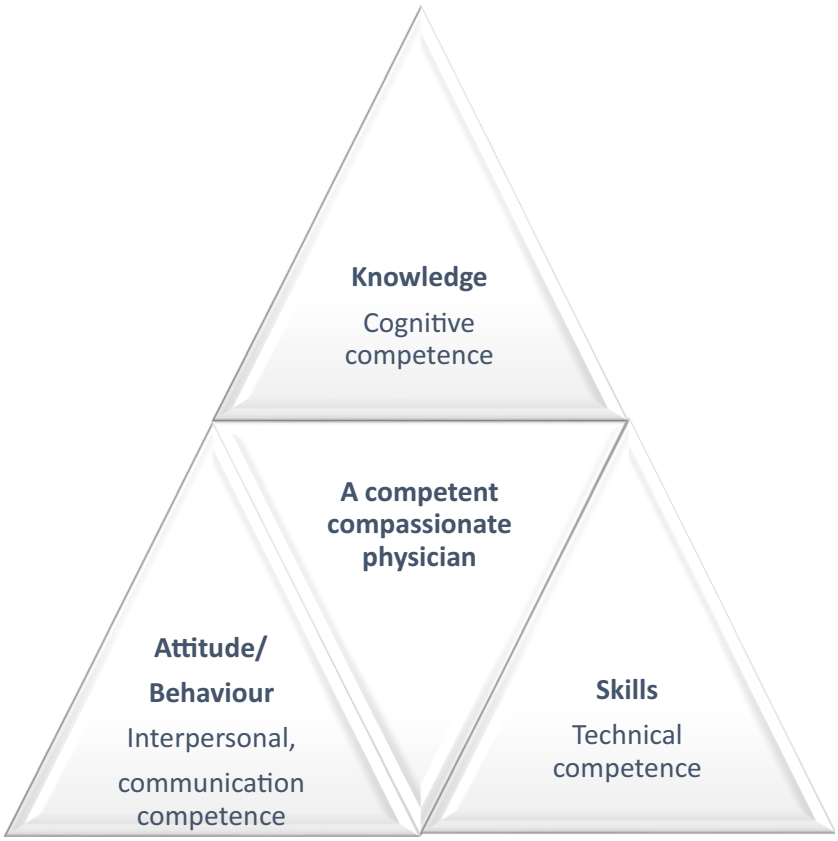

Fig. 1 Medical student competencies

Table 1 Illustrative quotes explaining reasons for academic failure due to student factors

Student factors	Quotes
Lack of global competency	All exams in medicine have elements of pure knowledge. When you get to the medical school, you are challenged beyond your usual compensatory mechanisms. You cannot put in more hours of work when you are already in class and tutorials for 40 h a week. Until medical school, students have usually selected to concentrate on subjects they enjoy and achieved top marks in. But, in medicine students are judged on global performance. Students may have been absolutely masterful with technical skills and have top marks in their first degree such as engineering, architecture or some of the computer sciences; however, what are their empathy levels? How good are they at working in a tutorial group where for the first time they have to interact with people with completely different learning styles, people from different backgrounds, people who may not be as comfortable with numbers, figures and statistics as they are? This is where you will see a spread in the marks.
	Interpersonal and communication skills were called 'softer skills' for decades, and many junior learners, unfortunately, do not appreciate the importance of these skills. Countless times over the years, very novice learners have said to me 'oh, Dr. J do not spend so much time on that, they cannot test us on it.
	Some students are not technically inclined or they learn differently, or they have difficulty with visual interpretation. They may have terrific knowledge and attitudes but in the technical areas they need extra time, extra tutoring or someone to facilitate their learning.
Psychoeducational—learning difficulties	Then there are always some students in the class who have unrecognized, undiagnosed dyslexia. Interestingly many had second degrees, Masters or had started a PhD because they chose their Masters subject to their strengths and now in medical school they are challenged in all learning domains . There were students who were not sleeping because they were studying 8 h a day to try and keep up and obviously they were sabotaging their own performance.
	Students identified as having a learning challenge prior to medical school do very well.
	"Some of this comes down to economics, Some students came in with letters that clearly stated they had been assessed by private educational psychologists and that they were entitled to accommodations which they received from the get go."
Social and behavioral factors	The first group who fails is the disorganized. They have excellent volunteer experiences because their parents have had contacts and they drove them here and there. There are students who did not have to take the bus, they did not have to ride a bicycle all year round, or walk. This is a big group. If they come to attention quickly then they can blossom because it is a matter of time management advice.
	Second are those who are doing too many extracurricular activities and they are distracted. They do not realize that they went through high school doing no homework because school work was so easy. Some have excelled in specialty areas where there wasn't a lot of reading. There is a lot of reading in medical school and students have to learn to speed read. These students can be helped and they can reach their potential.
Physical and mental health	I will give you the worst example.: A student was sent for remediation to an excellent trained medical educator with a Master's in education. The first time, he came in late, looked a bit disheveled and did not seem interested. She (the teacher) had paid for a standardized patient to come in and she was going to watch history taking and physical examination. They struggled through, it wasn't very good. He comes back late the second day and again does not appear very neat. So she was just about to send him back and tell him this was a failed remediation and that they better try something else when her internist brain started kicking in. She phoned her ward and asked a nurse to bring an Accucheck machine and asked the student if she can check his blood sugar level. His blood sugar was completely off the map, he was in diabetic ketoacidosis. He was a Type 1 diabetic and he had not yet established himself with an endocrinologist. He was not going to a health clinic, or to his academy director to ask for help. He was admitted to hospital as he was very sick. He was issued with an insulin pump and once he was straightened out, this student was a star as he should have been.
	The highest onset of schizophrenia and several illnesses in the mental health occurs in the young adult.
Alcohol or drug problems	Secondly, there is the exposure to drugs and alcohol. Sometimes students have trouble if they have never tested their alcohol endurance. Because students with absolutely no experience have no supervision, they just get into trouble unwittingly
Life events especially with mature students	It is very wrong of us in the professions to admit mature students such as someone with a PhD, and expect them to put their life on hold. When we accept people like that we must acknowledge that they are a little older and it is time for them to get married or have a child; we cannot insist that they do not get married, that they do not have a family especially as half of the class are females. There may be life challenges going on and they may need time off. Often it is simply a matter of learning to study differently because your time commitments are different.
Lack of social support	These students, from across the spectrum of backgrounds, ethnicities, whether they are new in Canada or not, they had in common an inner drive to be first and to succeed and many of them had assistance along the way from professional parents (those with post- secondary education). Those students who had not been recognized, if we did not recognize them early enough (until they failed) they would have to repeat a year and this was a travesty.

Parental education, social support, and financial stability play an important role in early identification of learning challenges and reducing academic failures.

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Some students have physical or mental health challenges or substance misuse that puts them at risk of academic failure. Many students are away from their families and some lack the social support of a family. Mature students entering medical schools with graduate degrees or other

professional qualification have life challenges and may not be able to perform well academically.

3. Identification of students at risk of academic failure. Some students are self-aware and seek help "students who had better self-evaluation would come in and ask for help because they would say I am really struggling to keep up".

In reality, most medical students come to the attention of the student support services only after they fail an exam.

Unfortunately, in the pre-clinical years it was when they failed an exam that students were identified]. In fact, it wasn't until they failed the second exam that some came in.

Sometimes, peers helped to identify struggling students.

We had one young lady who had never sought treatment for being raped as a teenager. She had a panic attack and locked herself in a washroom when she was working standardized patients on pelvic examinations. Her classmates came to me and said she needed help. I could direct them saying that if she was not comfortable seeing me, she could go to the rape crisis center at hospital.

Allied health professionals especially nurses identify some students. "Nurses or other members of the team identify them as inappropriate with families or patients or unable to be a functional member of a diverse healthcare team."

4. The role of medical school student services. Preemptive actions at the beginning of medical school to help students identify the work involved in medical school and what areas they need to work on is important. It is also an opportunity to provide them with resources to manage campus life.

I send incoming classes a note saying 'you must meet with me before starting your first term'. Once students came to medical school and got busy they wouldn't come and see me unless it is a mandatory requirement.

It is important to identify students' areas of strengths and challenges to guide them to utilize available resources.

I would ask them what they hoped to get out of medical school If they weren't very talkative, I would ask "what were your best subjects at school, why did you decide to go into a Masters in such and such", and they are comfortable talking about their strengths instead of answering to 'what are you best at?'

Orientation can be used to provide resources and to normalize personal physical and mental illnesses as part of life so that students would seek without fear of embarrassment.

We would have presentations from a variety of people who speak of their own illnesses. For example, Dr. X would come and talk about all his embarrassing moments … . he had no fear at giving his experiences – good and bad – as a human being with chronic health issues or as someone who migrated from a different culture. We had Dr. Y who spoke widely of a close family member who has significant mental health issues. These individuals discuss the personal impact of illness and normalize illness to the students.

Medical schools should promote peer support among medical students**.** Peer support among medical students can be optimized and students can be coached to help each other.

Peer support in medical students is very strong and can be used to facilitate struggling student to seek help.

I find that the students can often solve the problem and they will identify colleagues that they are concerned about. Some struggling students may be embarrassed to seek help, but you can coach peers to go in two, threes, and say 'hey buddy, we notice you are not your usual self, and by the way would you like us to come to the health clinic with you'.

5. The role of the teacher in reducing academic failure. The role of the teacher is crucial for student success. Teachers have to be aware of the demands of the course they teach and the students' capabilities. Sometimes, the hidden curriculum has to be explicit as teachers are often not able to get past the student's attitude issues to explore the possible reasons for that attitude and performance or the lack of it.

Teachers have to be super aware of students' capabilities to be a learning facilitator. So it is your responsibility to figure out who your learners are and anticipate any areas they may have a weakness, as just passing is not good enough. Our students came in with A+ averages, they may fall to B+ but it has to be consistent over all their domains.

Teachers have to be alert to identify struggling students early "as they may just appear to be yawning or disinterested especially in large groups". A student's failure is a teacher's failure too.

It is easy to say that the students are lazy, not trying or not paying attention. But, the teachers have to take responsibility for the failures too.

Medical teachers, similar to any other teacher, have the ultimate responsibility to ensure academic success in students regardless of the student's age, experience, or prior qualifications.

> *It is a responsibility of teaching to ask and find support if any student is not performing as they should be. For example, if I was in class, and struggling with my words, I may be having a stroke and the teacher has a responsibility to identify my struggle and help me.*

The teacher does not always have to take the responsibility for remediation. But they should identify struggling students and direct them to get appropriate help;

> *"if you can't or don't think you have the time, there is an office of student affairs, ask who their mentor is or if they have a mentor"*

Suggestions for Medical Educators

Toolkits developed to identify students at risk of failure using criteria such as failure of 3 or more examinations per year, an overall average of < 50% [11], validate the assumptions from our manuscript that medical schools do not identify or intervene to help students at risk of failure and wait until they have failed.

Our experiences suggest that many students with undiagnosed learning challenges may be missed and not receive the help they need to succeed if teachers are not vigilant. Many medical school admissions require technical standards that limit admissions to students with physical or sensory disabilities [14]. However, there is no limitation or screening for other disabilities such as a learning disability, chronic illness related to either physical or mental health**.** A recent study identified 2.7% prevalence of disability among students in US allopathic medical schools [15]. Attention deficit hyperactivity disorder (ADHD) was the most common disability (33.7%), followed by learning disabilities (21.5%) and psychological disabilities (20.0%) [15]. This number represents total number of self-disclosed or registered students with disabilities receiving accommodations.

This paper identifies socioeconomic and family factors as impacted academic success in medical schools. Race has been recognized as impacting for academic performance in medical students from underrepresented minorities [16]. There is no information on socioeconomic disadvantages in professional practices. More recent articles advocate for an integrated approach for medical student success by routine monitoring of academic and behavioral criteria such as sudden drops in performance to identify students at risk of struggling and multiple evidence-based types of support to address the variety of at-risk students' needs [17].

We also suggest that mature students may have academic difficulties due to life events. Currently, there is no literature on "mature" students' struggles due to choosing to participate in life events or any actions being taken to accommodate older students who come with advanced degrees. This needs to be explored further in future studies.

One of the major limitations of this paper is that it is the view point of two educators. However, it provides information on the lifetime experiences of a medical educator at a prestigious university. We believe that the type of stories we shared and the lessons we learnt are not isolated to one university and can be useful to other teachers and educators to identify students at risk of failure and help them succeed.

Conclusion

Medical teachers have a responsibility for their students' academic and general wellness. Academic achievements, underperformance, and failures reflect a combination of system failures such as teachers ignoring early signs in struggling students; a university culture that only intervenes after students fail; medical school culture adjustments and student dynamics. Early identification and simple interventions can lead to wellness and academic success in medical schools.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest

Ethical Approval The institutional research ethics board waived a full ethics review as the participant is a co- investigator on the manuscript.

Informed Consent NA

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