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TWELVE TIPS

Twelve tips for providing effective student support in undergraduate medical education

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Abstract

Medical students often require high levels of specialised institutional and personal support to facilitate success. Contributory factors may include personality type, course pressures and financial hardship. Drawing from research literature and the authors' experience, 12 tips are listed under five subheadings: policy and systems; people and resources; students; delivering support; limits of support. The 12 tips provide guidance to organisations and individual providers that encourages implementation of good practice and helps them better visualise their role within the system. By following the tips, medical schools can make more effective provisions for the expected, diverse and sometimes specialist needs of their students. Schools must take a proactive, anticipatory approach to provide appropriately for their entire student body. This ensures that students receive the best quality support, are more likely to succeed and are adequately prepared for their medical careers.

Introduction

Effective academic and pastoral support is one of the crucial factors that contributes to student success in higher degree programmes (Tinto 1999) and enables a positive student experience. Due to the pressured nature of medical programmes and a common student profile of high levels of neuroticism and conscientiousness (Tyssen et al. 2007), medical students are more likely to suffer psychological distress during their studies (Dyrbye et al. 2006) but effective assistance from the faculty and wider learning community increases resilience and recovery from burnout (Dyrbye et al. 2010).

With trends towards greater diversity and widening participation (Dalley et al. 2009; James et al. 2008), medical students' learning and support needs are increasingly varied and complex. They also accrue high levels of debt due to typically higher fees and longer courses than students on many other degree programmes (Murphy 2012). Students increasingly see themselves as consumers, expecting high levels of academic and pastoral assistance. The challenge is to provide an academic and social network that caters for the diverse (and sometimes specialist) needs of individual students in a variety of learning environments, identifies struggling students early and prepares students to survive the rigours of a career in medicine. This article describes the key features and procedures involved in designing an effective system of support for undergraduate medical students.

Policy and systems

Tip 1

Understand the regulatory, policy and strategic context

Before developing or extending student support provisions, it is important to become familiar with the legal requirements and guidance provided by the university, healthcare providers, funding agencies and professional and regulatory bodies such as Medical Councils. Policies, procedures and systems should be regularly revisited to ensure the strategies reflect recent updates.

When writing policies, remember that most university and healthcare organisations already have policies designed to meet legal requirements (e.g. on equality and diversity). However, medical education (like other health professionals' education) has specific requirements due to the high volume of clinical placements in hospitals and community settings and Fitness to Practice regulations. International examples of policies, processes and guidance, can be useful although may need to be amended to suit the country or context. For example, the UK "Gateways to the Professions" document (General Medical Council, 2010) clearly sets out how medical schools can assist students with a wide range of disabilities through practical strategies and case examples.

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Tip 2

Establish clear, transparent management systems and processes

Effective support schemes must be underpinned by clearly defined management and committee structures that operate within regulatory and quality assurance systems. All processes and management systems should be clearly outlined and documented (e.g. in handbooks, policies or procedural guidance) to ensure accessibility and transparency. To help ensure processes and responsibilities work effectively in practice, relationships between the medical school, university and healthcare providers should be developed and maintained with frequent communication and cross-committee representation.

Individual students should be aware of when they are likely to be discussed and kept informed throughout the entire process. Wherever possible, student representatives should be included in committee membership although to maintain confidentiality, student representatives should not participate in discussion about individual students. It is important for faculty to operate within the boundaries of professional confidentiality taking into account students' status and patient safety: students are not patients and the responsibility towards students is different from that in other professional contexts.

People and resources

Tip 3

Know and use university services

Universities tend to have a huge range of support services including a Students' Union or Committee as well as some independent services catering to students' diverse needs. Taking time to find out what is available helps providers to make appropriate referrals, avoid unnecessary replication of services and identify where existing services may need to be adapted for medical students. Typical services include counselling, disability, financial, housing, study skills, specialist tuition (e.g. for dyslexia), occupational health and chaplaincy.

Regular meetings two or three times per year between the medical school staff responsible for pastoral and academic guidance and key staff from university services ensures that good communications are in place. Such meetings can help staff gain understanding of the full range of services available and referral/triage systems and enable problems with access to services to be resolved.

Tip 4

Identify staff roles and responsibilities

Roles and responsibilities for support staff must be clearly identified within all organisations where students are placed (i.e. the medical school, university and healthcare providers) and outlined to all personnel involved. There needs to be a clear distinction between those involved in a support role and those responsible for disciplinary, fitness to practice, assessment and academic progression proceedings. Blurring these boundaries can lead to difficulties for students and staff and make students more reticent to seek help.

Faculty development is important. Key people involved in supporting students (e.g. personal tutors, administrators, the university disability office, occupational health and academic or year tutors) need to be trained for their own role, and to understand the roles of others, professional boundaries and referral processes. Although many teachers may be experienced health professionals they are not necessarily experienced in providing academic and pastoral guidance to students or, because they work outside the university, may be unfamiliar with university systems, services and regulations. Support personnel need to have a means of getting up-to-date advice, sharing best practice and getting assistance with difficult, unusual or challenging cases (Steinert et al. 2010). Involvement with Student Services and relevant healthcare providers, especially counselling services, enables expert advice to be given and reinforces referral processes. When functioning in a support capacity, clinically trained staff should not take on clinical responsibility for those with health issues who are under their pastoral care.

Students

Tip 5

Identify student profiles and characteristics

Students' needs can be complex (Gutteridge 2001), varying between individuals, medical schools and cultures. Be aware of your "student profile" (e.g. in relation to cultural or ethnic background, age or gender) as this can often predict potential needs. For example, mature students (e.g. on graduate-entry programmes) may have a higher proportion of dependents or employment commitments and students working in certain countries or contexts (e.g. on overseas placements) may have additional vaccination or prophylactic requirements.

Some medical students hide, or do not disclose, their problems due to a range of factors including peer and parental pressure, perceived stigmatisation or fear of raising fitness to practice concerns (Chew-Graham et al. 2003). However, students who are likely to struggle typically display key characteristics that can often be identified early in their course (Hays et al. 2011; Table 1). Taking a proactive approach enables measures to be put in place before progression issues arise or a condition, such as a mental health problem, deteriorates and forces withdrawal from studies (Tait 2000). Those with a key support and guidance role should make themselves familiar with typical cases and solutions through prior or existing

Table 1. Profiles of students prone to needing extra support in medical schools (adapted from Hays et al. 2011).

- Poor learning skills: lack of study skills
- Poor learning skills: lack of knowledge basis
- Immaturity
- Poor organisational skills
- Poor insight
- Poor mental health
- Major personal crisis

experience within their organisation, professional networks or published material (Hays et al. 2011; Yates 2011).

Delivering support

Tip 6

Communicate guidance widely and remind frequently

Students and staff often display limited knowledge of their university support systems (Chew-Graham et al. 2003). This can be addressed by ensuring that information is communicated widely in a variety of formats such as online information systems, interactive e-modules, smart phone apps, handbooks, brochures, talks and training workshops. All correspondence should be clear, concise, easy-to-follow and accessible. Communicating guidance on systems should start when a student considers application to medical school (particularly relevant for students with disabilities) and continue until they graduate, sometimes beyond. Students should be reminded of sources of support around times of assessments and other stressful times within medical training (Radcliffe & Lester 2003).

Academic and administrative staff and students will "lose it if they don't use it", so should be reminded and updated on the systems annually so that information is accessible when needed.

Tip 7

Embed guidance and support in the curriculum, especially at times of vulnerability and transition

A proactive system fully embeds guidance and support within the curriculum (Table 2). Other examples of successful programmes have been reviewed by Prebble et al. (2004) and Cleland et al. (2013). Thought should be given to the timing of events (Gutteridge 2001), which should specifically target vulnerable transition points (e.g. start of the course, lead-up to examinations and moving onto internship) and attempt to minimise the effects of these.

Table 2. Examples of support activities that can be embedded into the curriculum.

- Study skills sessions (Pryjmachuk et al. 2012; Stegers-Jager et al. 2013; Winston et al. 2010)
- Practice examinations (Carrillo-de-la-Peña et al. 2009; Feletti & Neame 1981)
- Individually tailored assessment feedback (Cleland et al. 2010; Velan et al. 2008)
- Stress reduction techniques (Redwood & Pollack 2007; Saunders et al. 2007)
- Pre-/post-placement briefings/debriefings (Balandin et al. 2007; Johnson & Blinkhorn 2011; Rudolph et al. 2008)
- Timetabled academic and personal appraisals/performance reviews (Murdoch-Eaton & Levene 2004; Sobral 2000)
- Careers' advice (Coates et al. 2008; Zink et al. 2007)
- Personal and professional development sessions (Kalet et al. 2002; Macaulay et al. 2007)

If guidance and support is delivered on the understanding that student problems requiring extra assistance are common and expected, this may help to avoid the stigma associated with particular conditions (e.g. mental illness) and the need to access well-being services. One example is the Student-Led Stress Management Program for First-Year Medical Students at Oklahoma State University. Here first-year medical students are made aware of the risks of stress-related problems and offered membership of a stress-reduction peer group facilitated by trained second-year students (Redwood & Pollack 2007).

Tip 8

Recognise that students on clinical placements have different requirements

Whilst services tailored for university students should be utilised when medical students are studying within university facilities (Tip 3), students away from the main campus on clinical placements will have additional needs.

The clinical environment is highly pressured and demanding, students may feel isolated, separated from social networks and encounter difficult clinical situations, which may lead to well-being issues (Dyrbye et al. 2005). In order to provide sound advice, students should have access to a named pastoral tutor who has clinical experience. Schools need to ensure students have easy access to counselling and other relevant services whilst on placements. Staff who have regular contact with students require "first-response" training so that they are competent in recognising warning signs and referring on when necessary. Establishing named clinical leads and administrative staff wherever students are placed as the first points of contact is essential. Enabling access for such staff to university IT systems and student records is also necessary.

Accessing university-based facilities can be difficult when students are geographically remote or have long working hours. Medical schools need to work closely with university support services and healthcare organisations to explore ways of extending opening hours to improve student access. For students in need of regular access to specialist tuition or regular health-related appointments, placements nearer to such facilities should be available. In some cases, it may be expedient to allow students access to services normally reserved for healthcare employees. This may be particularly useful for students in remote locations or where short-term access to a particular facility may help minimise disruption of the clinical placement. Students should be given information about access to support services before they begin a placement at a particular site and this information should be available to students on all placements, e.g. via a medical school intranet.

Tip 9

Support systems need multiple access points

To facilitate student engagement with appropriate systems, multiple access points will help cater for individual student

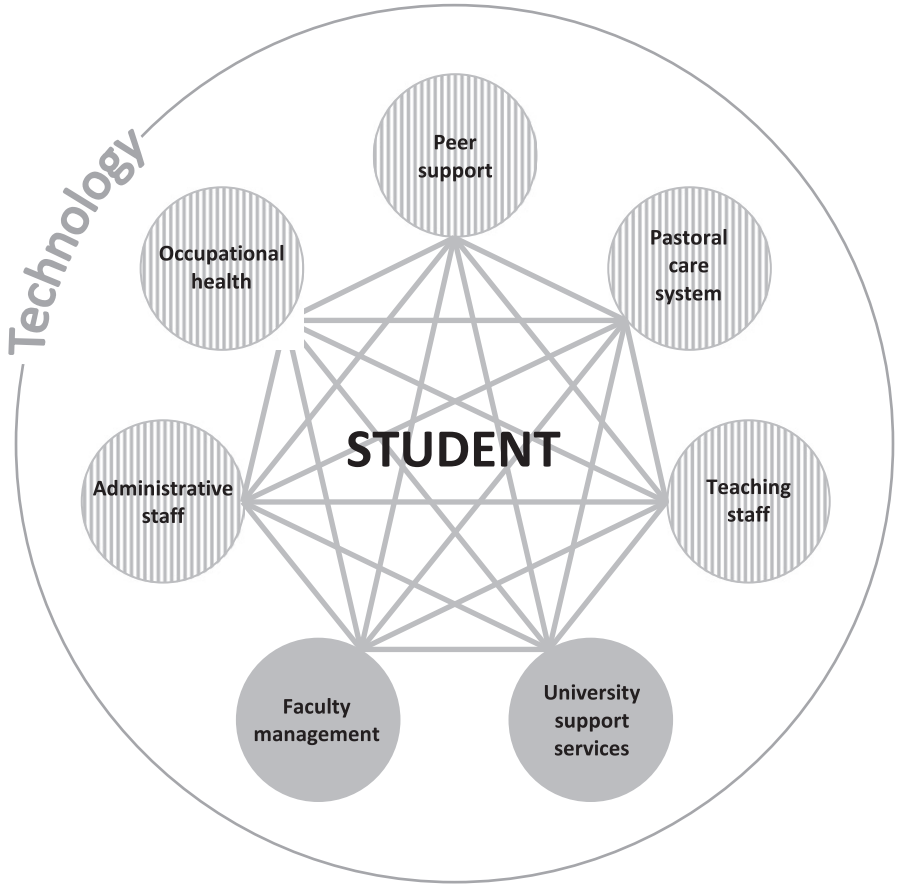

Figure 1. A diagrammatic representation of a multiple access point student support system underpinned by technology. Students can choose to access support through any one of the circles either via face-to-face contact or using technology (e.g. email, telephone and IT support system). All staff involved in the system must receive training on the range of support available to students and when to refer a student elsewhere within the inter-connected system or externally. The solid grey circles indicate largely university-based support services/staff. The striped grey circles indicate services/staff that can be potentially found at university and on clinical placements.

preferences and geographically dispersed clinical placements (Figure 1). New technologies (e.g. texting students with appointment dates or reminders; providing apps with support strategies) can assist in improving access to support provisions (Tait 2000) particularly when students only have remote access. However, systems must also accommodate students that either do not have, or choose not to, access support electronically or through mobile devices. Face-to-face contact is very important, particularly when dealing with vulnerable or distressed students.

A peer support structure (or "buddy" system) can be an invaluable addition to the formal network (Hillis et al. 2010). Students often feel more comfortable making initial contact with friends or with their peer-group. These systems need to be aligned with other systems in terms of training, boundary-setting and referral.

Tip 10

Identify students needing extra support early

Students who need high levels of specialist support should be identified as early as possible and, wherever possible, extra mechanisms should be put in place before the student fails academically or professionally. Students who are struggling with personal issues, such as financial or relationship issues, may first present as failing academically. High levels of non-attendance is common amongst strugglers (Yates 2011) who ultimately may fail to progress.

Systems should link in with admissions and selection processes so that students who have consented to disclose specialist health requirements on admission are contacted by Student Support Services as early as possible to put measures in place before they start the course. All students should be encouraged from the start of the programme to be open and honest about their difficulties. In addition, reducing the perceived stigma associated with certain conditions (Tip 7), medical schools should work hard at overcoming the reluctance of students to seek help (Cleland et al. 2005; Malik 2000) and engage with remediation activities (Stegers-Jager et al. 2013; Winston et al. 2010). Every student requiring extra help will have slightly different needs and systems must be able to provide a package of support that reflects those individual needs (Dyrbye et al. 2005).

Limits of support

Tip 11

Recognise when and how to withdraw support

Whilst it is important to assist students where needed, it is also vital that graduates are safe and competent to practice independently and are aware of their future, possibly on-going, needs as practising clinicians. As outlined by professional bodies, such as the UK General Medical Council (General Medical Council and Medical Schools' Council, 2009), medical students need to take self-responsibility and develop insight as to when health issues and well-being may affect their ability to function in a professional capacity.

Obviously, some support provisions and reasonable adjustments (e.g. for students with physical or sensory disabilities) will be permanent and extend into their working lives. However, in cases of learning disabilities (e.g. dyslexia and dyspraxia), behavioural and mental health difficulties, the medical school's responsibilities are to help students develop coping strategies and then test whether these translate into an ability to work safely and independently in clinical practice. Thus, there must be a strategy for determining whether the student needs long-term assistance and, if so, whether this is compatible with a career in medicine.

In cases of academic remediation, students should be provided with a programme that helps them address areas of weakness. The remediation processes need to be assessed in relation to each individual student, and this is most effective when support interventions are put in place as early as possible. This, once again, makes explicit the importance of recognising struggling students early, creating an environment where students feel free to disclose and where needing help is seen as commonplace and without stigma.

Tip 12

Shifting from support to sanction

Once students have been admitted, schools are obliged to help them to achieve their potential and graduate as doctors. A very small number, however, will encounter academic or professional difficulties that cannot be remedied, thereby preventing those students from graduating. A few students will have made the wrong career choice and, in a very small minority, faculty will identify characteristics that make the student unsuitable for a medical career. Medical schools need to distinguish between the "labour of love" (remediation) vs the "labour of law" (regulatory processes). From a patient safety perspective, it is therefore vital to identify students who may be a danger to the public or, for whatever reason, are unable to practise medicine safely. For their own protection and that of the student, medical schools need to set clear, transparent, defensible procedures which identify struggling students early and enable the right support to be provided, giving the opportunity for the student to remediate, but ensuring any unfit student does not go on to practise medicine (e.g. General Medical Council and Medical Schools' Council 2009). Although they may not want to hear it, it is important to be honest with students when a career in medicine is deemed unsuitable for them and the reasons why this conclusion has been reached. Such students should be offered counselling and guidance, to enable them to explore alternative career or study options. To ensure that these students gain as much as possible from their time spent studying medicine, programmes should ideally build in clear exit points throughout the course so that students can exit with appropriate credits or awards.

Conclusions

These 12 tips provide a framework within which medical schools can deliver effective support and guidance to a diverse range of students. Medical schools are encouraged to take a proactive and anticipatory approach to providing a system that is based on the needs of their student population. The system should be informed by policy, have multiple access points, harness technology, be embedded in the curriculum and communicated widely. Personnel involved in this system may change according to the stage of the students training. They must have defined roles and receive appropriate training on referral processes. Support, in almost all cases, should aim to enable the student to address and develop insight into their needs, enabling them to continue independently in their studies and subsequent medical practice. Unfortunately, on rare occasions, these measures are not enough and medical schools must recognise when to shift from support to sanction.

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References

Balandin S, Lincoln M, Sen R, Wilkins DP, Trembath D. 2007. Twelve tips for effective international clinical placements. Med Teach 29(9):872–877.

Carrillo-de-la-Peña MT, Baillès E, Caseras X, Martínez À, Ortet G, Pérez J. 2009. Formative assessment and academic achievement in pre-graduate students of health sciences. Adv Health Sci Educ Theory Pract 14(1):61–67.

Chew-Graham CA, Rogers A, Yassin N. 2003. 'I wouldn't want it on my CV or their records': Medical students' experiences of help-seeking for mental health problems. Med Educ 37(10):873–880.

Cleland J, Arnold R, Chesser A. 2005. Failing finals is often a surprise for the student but not the teacher: Identifying difficulties and supporting students with academic difficulties. Med Teach 27(6):504–508.

Cleland J, Legget H, Sandars J, Costa MJ, Patel R, Moffat M. 2013. The remediation challenge: Theoretical and methodological insights from a systematic review. Med Educ 47(3):242–251.

Cleland J, Mackenzie RK, Ross S, Sinclair HK, Lee AJ. 2010. A remedial intervention linked to a formative assessment is effective in terms of improving student performance in subsequent degree examinations. Med Teach 32(4):e185–190.

Coates WC, Crooks K, Slavin SJ, Guiton G, Wilkerson L. 2008. Medical school curricular reform: Fourth-year colleges improve access to career mentoring and overall satisfaction. Acad Med 83(8):754–760.

Dalley B, Podawiltz A, Castro R, Fallon K, Kott M, Rabek J, Richardson J, Thomson W, Ferry P, Mabry B, *et al.* 2009. The Joint Admission Medical Program: A statewide approach to expanding medical education and career opportunities for disadvantaged students. Acad Med 84(10):1373–1382.

Dyrbye LN, Power DV, Massie FS, Eacker A, Harper W, Thomas MR, Szydlo DW, Sloan JA, Shanafelt TD. 2010. Factors associated with resilience to and recovery from burnout: A prospective, multi-institutional study of US medical students. Med Educ 44(10):1016–1026.

Dyrbye LN, Thomas MR, Shanafelt TD. 2005. Medical student distress: Causes, consequences, and proposed solutions. Mayo Clin Proc 80(12):1613–1622.

Dyrbye LN, Thomas MR, Shanafelt TD. 2006. Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students. Acad Med 81(4):354–373.

Feletti GI, Neame RLB. 1981. Curricular strategies for reducing examination anxiety. High Educ 10(6):675–686.

General Medical Council and Medical Schools Council. 2009. Medical Students: Professional Values and Fitness to Practise, London: General Medical Council. [Accessed 30 April 2013] Available from http://www.gmc-uk.org/static/documents/content/GMC_Medical_Students.pdf.

General Medical Council. 2010. Gateways to the Professions: Advising medical schools: encouraging disabled students, London: General Medical Council. [Accessed 30 April 2013] Available from http://www.gmcuk.org/education/undergraduate/gateways_guidance.asp

Gutteridge R. 2001. Student support, guidance and retention; re-defining additional needs[online]. Paper presented at the Qualitative Evidence-based Practice Conference, Taking a Critical Stance, 14/16 May 2001, Coventry University, UK. [Accessed 13 May 2013] Available from: http://www.heacademy.ac.uk/resources/detail/resource_database/litreviews/LITREV_Student_support_guidance_and_retention_re_defining_additional_needs

Hays RB, Lawson M, Gray C. 2011. Problems presented by medical students seeking support: A possible intervention framework. Med Teach 33(2):161–164.

Hillis JM, Perry WR, Carroll EY, Hibble BA, Davies MJ, Yousef J. 2010. Painting the picture: Australasian medical student views on wellbeing teaching and support services. Med J Aust 192(4):188–190.

James D, Ferguson E, Powis D, Symonds I, Yates J. 2008. Graduate entry to medicine: widening academic and socio-demographic access. Med Educ 42(3):294–300.

Johnson GE, Blinkhorn AS. 2011. Student opinions on a rural placement program in New South Wales, Australia. Rural Remote Health 11(2):1703.

Kalet A, Krackov S, Rey M. 2002. Mentoring for a new era. Acad Med 77(11):1171–1172.

Macaulay W, Mellman LA, Quest DO, Nichols GL, Haddad Jr J, Puchner PJ. 2007. The advisory dean program: a personalized approach to academic and career advising for medical students. Acad Med 82(7):718–722.

Malik S. 2000. Students, tutors and relationships: The ingredients of a successful student support scheme. Med Educ 34(8):635–641.

Murdoch-Eaton DG, Levene MI. 2004. Formal appraisal of undergraduate medical students: Is it worth the effort? Med Teach 26(1):28–32.

Murphy H. 2012. What will you earn as a junior doctor? Student BMJ 20:e4239.

Prebble T, Hargrave H, Leach L, Naidoo K, Suddaby G, Zepke N. 2004. Impact of student support services and academic development programmes on student outcomes in undergraduate tertiary study: A synthesis of the research. Wellington: New Zealand Ministry of Education.

Pryjmachuk S, Gill A, Wood P, Olleveant N, Keeley P. 2012. Evaluation of an online study skills course. Active Learn Higher Educ 13(2):155–168.

Radcliffe C, Lester H. 2003. Perceived stress during undergraduate medical training: A qualitative study. Med Educ 37(1):32–38.

Redwood S, Pollak M. 2007. Student-led stress management program for first-year medical students. Teach Learn Med 19(1):42–44.

Rudolph JW, Simon R, Raemer DB, Eppich WJ. 2008. Debriefing as formative assessment: Closing performance gaps in medical education. Acad Emerg Med 15(11):1010–1016.

Saunders PA, Tractenberg RE, Chaterji R, Amri H, Harazduk N, Gordon JS, Lumpkin M, Haramati A. 2007. Promoting self-awareness and reflection through an experiential Mind-Body Skills course for first year medical students. Med Teach 29(8):778–784.

Sobral DT. 2000. An appraisal of medical students' reflection-in-learning. Med Educ 34(3):182–187.

Stegers-Jager KM, Cohen-Schotanus J, Themmen APN. 2013. The effect of a short integrated study skills programme for first-year medical students at risk of failure: A randomised controlled trial. Med Teach 35(2):120–126.

Steinert Y, Mann K, Centeno A, Dolmans D, Spencer J, Gelula M, Prideaux D. 2010. Faculty development: If you build it, they will come. Med Educ 44(9):900–907.

Tait A. 2000. Planning student support for open and distance learning. Open Learn 15(3):287–299.

Tinto V. 1999. Taking retention seriously: Rethinking the first year of college. NACADA J 19(2):5–9.

Tyssen R, Dolatowski FC, Røvik JO, Thorkildsen RF, Ekeberg O, Hem E, Gude T, Grønvold NT, Vaglum P. 2007. Personality traits and types predict medical school stress: A 6-year longitudinal and nationwide study. Med Educ 41(8):781–787.

Velan GM, Jones P, McNeil HP, Kumar RK. 2008. Integrated online formative assessments in the biomedical sciences for medical students: Benefits for learning. BMC Med Educ 8:52.

Winston K, van der Vleuten C, Scherpbier A. 2010. An Investigation into the design and effectiveness of a mandatory cognitive skills programme for at-risk medical students. Med Teach 32(3):236–243.

Yates J. 2011. Development of a 'toolkit' to identify medical students at risk of failure to thrive on the course: An exploratory retrospective case study. BMC Med Educ 11:95.

Zink BJ, Hammoud MM, Middleton E, Moroney D, Schigelone A. 2007. A comprehensive medical student career development program improves medical student satisfaction with career planning. Teach Learn Med 19(1):55–60.