Problem-based learning: a strategy for building resilience

Virginia Inclán-Rubio[1], Raúl Sampieri Cabrera[2]

Corresponding author: Prof Raúl Sampieri Cabrera sampieri@comunidad.unam.mx
Institution: 1. Departamento de Fisiología, Facultad de Medicina, Universidad nacional Autónoma de México, 2. Universidad Nacional Autónoma de México
Categories: Educational Strategies, Teachers/Trainers (including Faculty Development), Teaching and Learning

Received: 05/07/2020
Published: 23/12/2020

Abstract

This work is the result of a collegiate reflection and describes a problem-based activity for building resilience. We believe that it is essential to analyze the factors that influence the development of resilience in health sciences students, to design educational intervention strategies that contribute to the development of support networks.

Keywords: Resilience; Medical Students; Stress; Medical Education; Problem-based learning

Discussion of the proposal

Health science students are regularly exposed to high levels of stress and depression throughout their academic training (Rosiek et al., 2016), which has been reported to impact their academic performance, and contributes to a decrease in their mental health (Alshamlan et al., 2020), (Lin et al., 2020; Moir et al., 2018, Puthran et al., 2016).

Some factors correlated with academic performance are psychosocial and intrinsic to the individual (physiological factors). Among the psychosocial, we can find the socioeconomic level, educational level, perceived social support, among others (Puddey, Playford and Mercer, 2017; Gómez et al., 2015). On the other hand. The intrinsic factors of the individual correspond to the quality of sleep, hormonal levels, and neurotransmitters.

In the literature, we can find studies that relate these factors to the academic performance of students, finding levels of correlation that suggest a multifactorial behavior among them, which hinders their attention at a social and educational level (Curtis et al., 2017; Miletic et al., 2015; Zvauya et al., 2017).

We believe that working on and building better health science students' resilience will increase their academic performance and equip them for a demanding work environment (Hopkins et al., 2016; Wald, 2020). From an evolutionary point of view, species must possess the resilience to adapt socially to disadvantaged environments or...
represent obstacles in their individual and collective development. Under this concept, we allow ourselves to classify resilience into three groups:

1. Acquired resilience

Life stories and family history can be a way to build resilience in community members. It depends on the obstacles they have had to face and how they have been overcome (coping).

2. Self-managed resilience

The development of personal and group leadership capacities can contribute to the design of crisis coping strategies.

3. Reflective resilience

Learning from their own mistakes can help build and build resilience.

In higher education settings, the development of competencies that contribute to students' academic training is encouraged, forgetting about stress management, coping, and the development of resilience (Bandini et al., 2017; Dolev et al., 2019). For this reason, we believe that it is essential to include content in educational programs that promote the development of resilience, from an academic perspective (Stegers-Jager, Cohen-Schotanus and Themmen, 2017; Arvandi et al., 2016).

In this sense, project-based learning can be an educational tool that contributes to developing coping skills. The elements established can represent fundamental challenges for students at the cognitive, organizational, and teamwork levels.

We propose that students develop a research protocol in the different areas of the medical career (biomedical, social, educational and/or clinical) and that the topic is selected according to the students' interests. The project must contain elements that promote continuous and self-regulated learning. The aspects of the protocol must be detailed from its planning, development, and execution.

There will be four challenges that students will face:

- **Information search and selection skills**: to promote this ability, students will be guided to develop bioinformatics skills. Topics related to search algorithms and database selection should be included.

- **Organizational**: The students' level of organization and planning is evaluated, focusing on self-management strategies for work and time.

- **Cognitive**: It will be analyzed that students fully understand the topic they are developing. The evaluation will be done through seminars with experts that promote students' interest in the chosen topic.

- **Confidence development**: participation and development of collegiate activities will be encouraged. Students discuss the information presented by their academic peers. These sessions may be online seminars, round tables, and conversations.

The activities will be guided by an academic mentor who, in coordination with a psychosocial tutor, will monitor the level of motivation of the students, the possible problems they face, and will work on ways of coping.

Building resilience will be up to the individual participant and will only be helpful if trust can be established between.
students and their mentors and tutors. We are convinced that strategies such as these can contribute to the formation and development of support networks that would beneficially add to the training of medical students (Crossman, 2015; Ayala et al., 2017). Health science students need to form social support networks that allow them to overcome any adversity. We believe that educational intervention in academic settings is necessary to allow them to feel confident about themselves and that they are part of a work team (Slavin and Chibnall, 2016; Thompson et al., 2016).

A problem in medical schools is over-saturated curricula of cognitive components, which generate a significant stress load on students; not everyone can bear it, and most experienced frustration and anxiety (Dinis et al., 2020; Abu-Ghazaleh, et al., 2016).

We are convinced that the permanent and close collaboration of educational administrators, teachers, and researchers is essential to establish programs and strategies in favor of the mental health of students (Donohoe et al., 2020). In addition, the complexity and diversity of students that we have in public universities in developing countries should motivate us to establish academic support programs with high efficiency and low resources, which generate spaces for reflection for learning and that contribute to the formation of our students (Bacchi et al., 2020).

Likewise, we must begin to study the possibility of establishing academic programs that train leaders in health who promote healthy lifestyles and social responsibility. The authors are convinced that the changes in education that we are experiencing due to the COVID-19 pandemic should leave us lessons on how to train the new generation of health professionals (Cao et al., 2020).

The time to strategize is now; it is in our hands to be able to do it; we have the infrastructure, the digital media, and the trained human capital to achieve it. We have never been so willing to make changes that benefit our people. Adverse and, in some cases, traumatic situations aroused the resilience of many of us, and in others, it needs to be strengthened.

**Take Home Messages**

It is a challenge to establish strategies to achieve resilience since it implies first having a situation from which to have recovered, it would be irresponsible to do damage to see the response of individuals. Therefore, we propose an activity that is easy to carry out and that can help to strengthen the support networks of students and generate better levels of self-confidence.

The limitations of the study are that the study has not been tested, but it is a crucial time to do so.

**Notes On Contributors**

Dr. Raul Sampieri Cabrera, Head of the academic section of the Physiology Department of the UNAM Faculty of Medicine. She is interested in studying the psychosocial factors that participate in the academic performance of students. ORCiD: [https://orcid.org/0000-0001-7733-1105](https://orcid.org/0000-0001-7733-1105).

Dr. Virginia Inclán-Rubio, Head of the Physiology Department of the UNAM School of Medicine. She is interested in developing resilience in medical students.
Acknowledgements

None.

Bibliography/References

Abu-Ghazaleh, S. B., Sonbol, H. N. and Rajab, L. D. (2016) ‘A longitudinal study of psychological stress among undergraduate dental students at the University of Jordan’, *BMC Medical Education*, 16(1), pp. 1–6. https://doi.org/10.1186/s12909-016-0612-6.

AlShamlan, N. A., AlShamlan, R. A., AlShamlan, A. A., AlOmar, R. S., *et al.* (2020) ‘Prevalence of depression and its associated factors among clinical-year medical students in Eastern Province, Saudi Arabia’, *Postgraduate Medical Journal*, pp. 343–348. https://doi.org/10.1136/postgradmedj-2020-137578.

Arvandi, Z., Emami, A., Zarghi, N., Alavinia, S. M., *et al.* (2016) ‘Linking medical faculty stress/burnout to willingness to implement medical school curriculum change: A preliminary investigation’, *Journal of Evaluation in Clinical Practice*, 22(1), pp. 86–92. https://doi.org/10.1080/10499091.2016.1271334.

Ayala, E. E, Omorodion, A. M., Nmecha, D., Winseman, J. S., *et al.* (2017) ‘What Do Medical Students Do for Self-Care? A Student-Centered Approach to Well-Being’, *Teaching and Learning in Medicine*. Taylor & Francis, 29(3), pp. 237–246. https://doi.org/10.1080/10401334.2016.1271334.

Bacchi, S., Asahina, A., Wang, D., Wagner, M, *et al.* (2020) ‘The associations among medical student debt, distress and resilience in the early years of medical school: an international cross-sectional study’, *Australasian Psychiatry*, 28(4), pp. 468–469. https://doi.org/10.1177/1039856220917078.

Bandini, J., Mitchell, C., Epstein-Peterson, Z. D., Amobi, A., *et al.* (2015) ‘Student and Faculty Reflections of the Hidden Curriculum: How Does the Hidden Curriculum Shape Students’ Medical Training and Professionalization?’, *American Journal of Hospice and Palliative Medicine*, 34(1), pp. 57–63. https://doi.org/10.1177/1049901115616359.

Cao, W., Fang, Z., Hou, G., Han, M., *et al.* (2020) ‘The psychological impact of the COVID-19 epidemic on college students in China’, *Psychiatry Research*, 287, p. 112934. https://doi.org/10.1016/j.psychres.2020.112934.

Crossman, J. M. (2015) ‘Using Behavior Change Plans to Make Wellness an Informed Priority: Health Education Meets General Education’, *NERA Conference Proceedings 2015*, pp. 1–19. Available at: https://opencommons.uconn.edu/nera-2015/1 (Accessed: 30 September 2020).

Curtis, E., Wikaire, E., Jiang, Y., McMillan, L., *et al.* (2017) ‘Examining the predictors of academic outcomes for indigenous Maori, Pacific and rural students admitted into medicine via two equity pathways: A retrospective observational study at the University of Auckland, Aotearoa New Zealand’, *BMJ Open*, 7(8), pp. 1–11. https://doi.org/10.1136/bmjopen-2017-017276.

Dinis, T., Santiago, L. M., Caetano, I. R. and Marôco, J. P. (2020) ‘Perfectionism, burnout and extracurricular activities among medical students from the University of Coimbra’, *Acta Medica Portuguesa*, 33(6), pp. 367–375. https://doi.org/10.20344/amp.12083.

Dolev, N., Goldental, N., Reuven-Lelong, A. and Tadmor, T. (2019) ‘The evaluation of emotional intelligence among medical students and its links with non-cognitive acceptance measures to medical school’, *Rambam Maimonides Medical Journal*, 10(2), pp. 1–12. https://doi.org/10.5041/RMMJ.10365.

Donohoe, J., O’Rourke, M., Hammond, S., Stoyanov, S., *et al.* (2020) ‘Strategies for Enhancing Resilience in
Medical Students: a Group Concept Mapping Analysis’, *Academic Psychiatry*, 44(5), pp. 427–431. [https://doi.org/10.1007/s40596-020-01208-x](https://doi.org/10.1007/s40596-020-01208-x).

Moir, F., Yelder, J., Sanson, J. and Chen, Y. (2018) ‘Depression in medical students: current insights’, *Advances in Medical Education and Practice*, 9, pp. 323–333. [https://doi.org/10.2147/AMEP.S137384](https://doi.org/10.2147/AMEP.S137384).

Gómez H., P, Pérez V., C., Parra P., P., Ortiz M., L., et al. (2015) ‘Academic achievement, engagement and burnout among first year medical students’, *Revista médica de Chile*, 143(7), pp. 930–937. [https://doi.org/10.4067/S0034-98872015000700015](https://doi.org/10.4067/S0034-98872015000700015).

Hopkins, L., Saciragic, L., Kim, J. and Posner, G. D. (2016) ‘The Hidden Curriculum: Exposing the Unintended Lessons of Medical Education’, *Cureus*, 8(10). [https://doi.org/10.7759/cureus.845](https://doi.org/10.7759/cureus.845).

Lin, X. J., Zhang, C. Y., Yang, S., Hsu, M. L., et al. (2020) ‘Stress and its association with academic performance among dental undergraduate students in Fujian, China: A cross-sectional online questionnaire survey’, *BMC Medical Education*, 20(181), pp. 1–9. [https://doi.org/10.1186/s12909-020-02095-4](https://doi.org/10.1186/s12909-020-02095-4).

Miletic, V, Lukovic J. A., Ratkovic, N., Aleksic, D., et al. (2015) ‘Demographic risk factors for suicide and depression among Serbian medical school students’, *Social Psychiatry and Psychiatric Epidemiology*, 50(4), pp. 633–638. [https://doi.org/10.1007/s00127-014-0950-9](https://doi.org/10.1007/s00127-014-0950-9).

Puddey, I. B., Playford, D. E. and Mercer, A. (2017) ‘Impact of medical student origins on the likelihood of ultimately practicing in areas of low vs high socio-economic status’, *BMC Medical Education*. 17(1), pp. 1–13. [https://doi.org/10.1186/s12909-016-0950-9](https://doi.org/10.1186/s12909-016-0950-9).

Puthran, R., Zhang, M. W. B., Tam, W. W. and Ho, R. C. (2016) ‘Prevalence of depression amongst medical students: A meta-analysis’, *Medical Education*, 50(4), pp. 456–468. [https://doi.org/10.1111/medu.12962](https://doi.org/10.1111/medu.12962).

Rosiek, A., Rosiek-Kryszewska, A., Leksowski, L. and Leksowski, K. (2016) ‘Chronic stress and suicidal thinking among medical students’, *International Journal of Environmental Research and Public Health*, 13(2), pp. 1–16. [https://doi.org/10.3390/ijerph13020212](https://doi.org/10.3390/ijerph13020212).

Slavin, S. J. and Chibnall, J. T. (2016) ‘Finding the why, changing the how: Improving the mental health of medical students, residents, and physicians’, *Academic Medicine*, 91(9), pp. 1194–1196. [https://doi.org/10.1097/ACM.0000000000001226](https://doi.org/10.1097/ACM.0000000000001226).

Stegers-Jager, K. M., Cohen-Schotanus, J. and Themmen, A. P. N. (2017) ‘The Four-Tier Continuum of Academic and Behavioral Support (4T-CABS) model: An integrated model for medical student success’, *Academic Medicine*, 92(11), pp. 1525–1530. [https://doi.org/10.1097/ACM.0000000000001685](https://doi.org/10.1097/ACM.0000000000001685).

Thompson, G., McBride, R. B., Hosford, C. C. and Halaas, G. (2016) ‘Resilience Among Medical Students: The Role of Coping Style and Social Support’, *Teaching and Learning in Medicine*. Taylor & Francis, 28(2), pp. 174–182. [https://doi.org/10.1080/10401334.2016.1146611](https://doi.org/10.1080/10401334.2016.1146611).

Wald, H.S. (2020) ‘Optimizing resilience and wellbeing for healthcare professions trainees and healthcare professionals during public health crises – Practical tips for an ‘integrative resilience’ approach’, *Medical Teacher*, 42(7), pp. 1–12. [https://doi.org/10.1080/0142159X.2020.1768230](https://doi.org/10.1080/0142159X.2020.1768230).

Zvauya, R., Oyebode, F., Day, E. J., Thomas, C. P., et al. (2017) ‘A comparison of stress levels, coping styles and psychological morbidity between graduate-entry and traditional undergraduate medical students during the first 2 years at a UK medical school’, *BMC Research Notes*, 10 (93), pp. 1–10. [https://doi.org/10.1186/s13104-017-2395-1](https://doi.org/10.1186/s13104-017-2395-1).
Appendices

None.

Declarations

The author has declared that there are no conflicts of interest.

This has been published under Creative Commons "CC BY 4.0" (https://creativecommons.org/licenses/by-sa/4.0/)

Ethics Statement

The approval of an ethics committee was not necessary since sensitive human data were not used.

External Funding

The authors thank the Programa de Apoyo a Proyectos de Investigación e Innovación Tecnológica (PAPIIT), Dirección General de Personal Académico, Universidad Nacional Autónoma de México. Grant number IN309920.

MedEdPublish: rapid, post-publication, peer-reviewed articles on healthcare professions’ education. For more information please visit www.mededpublish.org or contact mededpublish@dundee.ac.uk.