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Teaching support material

**System of methodological activities for the training of medical students on
disabling sequelae post-COVID-19**

System of methodological activities for training medical students on disabling
post-COVID-19 sequelae

System of methodological activities for the training of medical students on
disabling consequences post-COVID-19

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SUMMARY

The COVID-19 pandemic has left significant marks on public health, extending far beyond the acute illness. A considerable number of survivors experience disabling sequelae that affect their quality of life and daily functioning. In this regard, medical students must be



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trained, and therefore, educational initiatives are needed for this purpose. For this reason, the objective is to design a system of methodological activities for training medical students on post-COVID-19 disabling sequelae. To this end, an analysis was conducted of the main physical and psychological sequelae faced by patients after SARS-CoV-2 infection. Similarly, surveys and interviews were carried out with several medical students and professors to understand their learning needs regarding the management of post-COVID-19 disabling sequelae. This allowed for the design of a system of activities consisting of five sessions, each characterized by its duration, topic, specific objectives, materials, activities, and conclusion. The sessions are designed to address the disabling sequelae of COVID-19, the assessment of respiratory sequelae, neurological impact, psychological sequelae, and the interdisciplinary approach. Research demonstrates the need to integrate interdisciplinary knowledge and patient-centered clinical practices. This approach will not only enhance professional competence but also prepare future physicians to face emerging public health challenges. Curriculum updates during the training process are essential for an effective and empathetic response.

Keywords: Methodological activities; Medical students; Post-acute syndrome of COVID-19

ABSTRACT

The COVID-19 pandemic has left significant marks on public health that extend beyond the acute disease. A considerable number of survivors present disabling consequences that affect their quality of life and daily functioning. In this sense, medical students must be properly trained, requiring educational actions aimed at this purpose. Therefore, the objective of this study is to design a system of methodological activities for the training of medical students on disabling post-COVID-19 sequelae. To this end, an analysis was carried out on the main physical and psychological sequelae faced by patients after SARS-CoV-2 infection. Likewise, surveys and interviews were conducted with several medical students and professors to identify learning needs regarding the management of post-COVID-19



disabling sequelae. This process made it possible to design a system of activities consisting of five sessions, each characterized by its duration, topic, specific objectives, materials, activities, and closing. The sessions are aimed at addressing the introduction to disabling COVID-19 sequelae, assessment of respiratory sequelae, neurological impact, psychological sequelae, and interdisciplinary approach. The research highlights the need to integrate interdisciplinary knowledge and patient-centered clinical practices. This approach will not only improve professional competence but also prepare future physicians to face emerging public health challenges. Curricular updating during the training process is essential for an effective and empathetic response.

Keywords:Methodological activities; Medical students; Post-Acute COVID-19 Syndrome.

SUMMARY

The COVID-19 pandemic has left significant scars in public health, which transcends acute illness. A considerable number of survivors suffer from disabling consequences that affect their quality of life and daily functioning. In this sense, medical students need to be trained, therefore, directed educational activities are only necessary. Therefore, the objective is to develop a system of methodological activities for the training of medical students on post-COVID-19 disabling consequences. Therefore, an analysis of the main physical and psychological consequences faced by patients after SARS-CoV-2 infection was carried out. Likewise, questionnaires and interviews were conducted with various medical students and professors to understand their learning needs in relation to the management of disabling consequences post-COVID-19. This allows the conception of a system of activities composed of five sessions, characterized by introduction, duration, theme, specific objectives, materials, activities and closure. The sessions address the introduction of the incapacitating consequences of COVID-19, the evaluation of the respiratory consequences, the neurological impact, the psychological consequences and an interdisciplinary approach. Research demonstrates the need to integrate interdisciplinary knowledge into non-patient-



centered clinical practices. This approach will not only strengthen professional competence, but will also prepare future doctors to face emerging public health challenges. Curriculum updating during the training process is essential for an effective and empathetic response.

Key words:Methodological activities; Medical Students; Acute Post-COVID-19 Syndrome.

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Introduction

The COVID-19 pandemic has had a profound and lasting impact on all aspects of life, and the health sector has been no exception. This global health emergency has not only challenged healthcare systems but has also exposed the vulnerability of individuals to a disease that can leave disabling sequelae of various kinds. In this context, the training of future healthcare professionals becomes a paramount task. This highlights the importance of developing a system of methodological activities for medical students that enables them to effectively identify and address these sequelae. (1,2)

COVID-19 has revealed that medical care cannot be limited to treating acute illness; it is also essential to prevent, identify, and rehabilitate the chronic sequelae that can arise after infection. These sequelae range from pulmonary and cardiovascular problems to neurological and psychological disorders. Therefore, future physicians must be equipped with both theoretical and practical tools that enable them to understand and manage long-term effects. This requires a methodical and reflective approach to learning, which students can apply in real-world situations. (1,3)

The development of a system of methodological activities must address several essential components. First, it is crucial to include theoretical activities that provide students with a



solid conceptual framework on COVID-19, its mechanisms, symptoms, and the various sequelae that can arise. This theoretical foundation must be complemented by practical activities that allow students to apply the acquired knowledge in simulated or real-world scenarios, thus fostering the acquisition of clinical skills. Furthermore, reflective activities are key to promoting a deeper and more critical understanding of the impact of COVID-19, as well as the importance of empathy and communication with patients in the recovery process. (2,4)

Practical activities, for example, can include clinical case simulations involving patients with specific COVID-19 sequelae. These simulations not only allow students to practice assessment and diagnosis, but also promote discussion about treatment approaches and the importance of a multidisciplinary approach to rehabilitation. Likewise, theoretical activities should be dynamic and interactive, employing educational technologies that facilitate learning and reflect the constantly evolving knowledge about the virus and its effects. (5)

On the other hand, reflective activities encourage students to evaluate their own learning and clinical experiences, prompting them to question their own perceptions and attitudes toward disabling sequelae. This will help them develop a holistic view of patient care and recognize the importance of humanization in medical practice. The ability to reflect critically on their training and on the reality of healthcare in the context of the pandemic is vital for shaping conscientious and committed professionals. (6,7)

Furthermore, it is essential to consider how this system of methodological activities fits within the academic curriculum of the medical degree program. By integrating these activities across the curriculum, not only will a more comprehensive and contextualized education be fostered, but research and independent learning among students will also be encouraged. Promoting an academic environment where future physicians can investigate new sequelae and treatments associated with COVID-19 will allow them to stay up-to-date and prepared to face the challenges that arise in their professional practice. (5,8)

The development of a system of methodological activities also involves the collaboration of teachers, healthcare professionals, and other relevant stakeholders in student training. This fosters collaborative learning, in which experiences and knowledge are shared, enriching the educational process. Creating spaces for information exchange and joint problem-solving is essential to preparing students for a work environment that increasingly demands adaptability and interpersonal skills. (9,10)

The ability to identify and address the long-term effects of COVID-19 is not only an essential clinical skill, but also reflects an ethical commitment to public health and social well-being. Training these professionals is fundamental to promoting a more resilient and future-proof healthcare system. Therefore, this study proposes the design of a system of methodological activities for training medical students on disabling long-term effects of COVID-19.

Development

A system of methodological activities refers to an organized set of pedagogical practices that aim to facilitate learning and teaching in diverse educational contexts. This system seeks to integrate different strategies and resources that respond to the needs and characteristics of students, in order to achieve a dynamic and participatory learning environment. (11)

Methodological activities should be varied and include approaches such as lectures, cooperative learning, case studies, and the use of information and communication technologies, among others. This will enable students to develop critical and creative skills, as well as competencies that will be useful in their professional and personal lives. (12)

Planning is fundamental in this system, as each activity must align with the course objectives and learning expectations. When designing activities, it is essential to consider the diversity of students, so as to promote inclusion and ensure that everyone has opportunities to participate and learn at their own pace. (6,12)



Furthermore, the system of methodological activities must incorporate formative assessment mechanisms that allow for feedback to both teachers and students. Assessments not only serve to grade, but are a valuable tool for reflecting on the learning process and adjusting the strategies implemented. (13)

Generally, a well-structured system of methodological activities is vital in education. It not only promotes meaningful learning but also prepares students to face the challenges of the modern world, equipping them with the necessary tools for their holistic development and future integration into society. In this regard, the following presents the design of a system of methodological activities for training medical students on disabling sequelae of COVID-19.

System of methodological activities for the identification of disabling sequelae post-COVID-19

General objective

To develop skills in medical students to identify and address disabling sequelae post-COVID-19 through practical, theoretical and reflective activities.

Detailed sessions

Session 1. Introduction to disabling sequelae post-COVID-19

- **Duration:** 2 hours.
- **Issue:** Basic concepts about COVID-19 and its aftereffects.
- **Specific objectives:** To understand the impact of COVID-19 on physical and mental health and to identify the main associated disabling consequences.
- **Materials:** PowerPoint presentations and scientific articles.
- **Activities:** Theoretical introduction (brief presentation on the SARS-CoV-2 virus and its effects), group dynamics (discussion in small groups about experiences related to patients), case study (analysis of a real clinical case), reflection and debate (discussion on the ethical implications of treating patients with sequelae).
- **Closing:** Selection of supplementary readings for the next session.



Session 2. Assessment of respiratory sequelae

- **Duration:**2 hours.
- **Issue:**Post-COVID-19 respiratory sequelae.
- **Specific objectives:**recognize common respiratory symptoms and sequelae, as well as learn how to perform an appropriate clinical assessment.
- **Materials:**respiratory assessment equipment and clinical manuals.
- **Activities:**Theoretical introduction (presentation on dyspnea and pulmonary fibrosis), group dynamics (role-play where one group acts as patient and another as doctor), case study (evaluation of a patient with lung damage), reflection and debate (discussion on pulmonary rehabilitation).
- **Closing:**Independent research work on psycho-pedagogical interventions in rehabilitation.

Session 3: Neurological Impact

- **Duration:**2 hours.
- **Issue:**Neurological sequelae post-COVID-19.
- **Specific objectives:**to identify neurological problems associated with COVID-19, as well as to assess a patient's neurological status.
- **Materials:**neurological assessment scales and illustrative videos.
- **Activities:**Theoretical introduction (presentation on encephalopathy and neurological disorders), group dynamics (creation of a mind map on neurological symptoms), case study (evaluation of a patient with neurological sequelae), reflection and debate (discussion on interdisciplinary management).
- **Closing:**Readings on neurorehabilitation.

Session 4: Psychological aftereffects

- **Duration:**2 hours.
- **Issue:**Mental health and psychological aftereffects post-COVID-19.
- **Specific objectives:**to understand the psychological impact of the pandemic, as well



as to identify common post-COVID-19 disorders.

- **Materials:** psychological assessment tests and scientific articles on mental health.
- **Activities:** Theoretical introduction (brief analysis on anxiety and depression), group dynamics (workshop on psychosocial interventions), case study (evaluation of a patient with post-traumatic stress disorder), reflection and debate (discussion on intervention strategies).
- **Closing:** preparation to address the aftermath in future sessions.

Session 5: Interdisciplinary Approach

- **Duration:** 2 hours.
- **Issue:** Multidisciplinary approach to the care of post-COVID-19 sequelae.
- **Specific objectives:** Understand the importance of teamwork in rehabilitation and develop a multidisciplinary care plan.
- **Materials:** intervention proposals and audiovisual material.
- **Activities:** Theoretical introduction (importance of the multidisciplinary approach), group dynamics (simulation of a health team meeting), case study (development of a comprehensive care plan), reflection and debate (analysis of strengths and weaknesses of the proposed model).
- **Closing:** course evaluation and feedback.

This system of methodological activities proposes a comprehensive training that combines theory, practice and reflection, which will allow students to develop the necessary skills to deal with the disabling sequelae of post-COVID-19 during medical practice.

The current context, marked by the COVID-19 pandemic, has highlighted the need for medical students to develop a specific set of skills to identify and address the disabling sequelae that this disease can cause. These skills are fundamental not only for their professional training, but also for providing comprehensive and sensitive care to patients.

(2)

First, students are expected to refine their clinical assessment skills. This includes learning



diagnostic tools and conducting effective interviews to identify physical and psychological symptoms associated with COVID-19. Practicing these skills in simulated environments or local communities is essential to consolidate theoretical learning. (4,6)

Furthermore, it is necessary to foster critical research skills. Students should be able to analyze and synthesize recent studies on the sequelae of COVID-19 by interpreting epidemiological data and understanding their implications for patient treatment and rehabilitation. This is achieved through theoretical activities that promote critical thinking and reflective discussion. (14)

Finally, empathy and communication are skills that must be emphasized. Medical students will need to learn to work with patients facing emotional and social challenges stemming from their injuries. Practical activities, including consultation simulations, can be valuable in developing a compassionate attitude and providing appropriate emotional support. (15)

In general, through this system of methodological activities integrated into their curriculum, medical students will be better prepared to effectively address the complex disabling sequelae of post-COVID-19, and thus contribute significantly to public health and the well-being of their future patients.

Conclusions

Research demonstrates the need to integrate interdisciplinary knowledge and patient-centered clinical practices. The approach outlined in the designed activity plan will not only enhance professional competence but also prepare future physicians to address emerging public health challenges. Curriculum updates during the training process are essential for an effective and empathetic response.



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Conflicts of interest

The authors of this research declare that they have no conflicts of interest.

Authorship contribution

Rolando Rodríguez Puga: Study design, literature review, information collection, writing, critical review of the article and approval of the final report.

Yoánder Pérez Díaz: Study design, literature review, information collection, critical review of the article, and approval of the final report.

Orisel del Carmen Rodríguez Abalo: Study design, literature review, information collection and approval of the final report.

I, Rolando Rodríguez Puga, on behalf of the authors, declare the veracity of the content of the article: System of methodological activities for the training of the medical student on disabling sequelae post-COVID-19.

