

УДК 159.8:614.46:378:61

DOI 10.11603/me.2414-5998.2020.3.11090

**O. P. Pakholchuk**ORCID <https://orcid.org/0000-0002-4827-1059>

ResearcherID O-2198-2016

**S. M. Nedelska**ORCID <https://orcid.org/0000-0003-2277-3875>

ResearcherID AAB-6246-2019

**S. V. Pavlov**ORCID <https://orcid.org/0000-0003-3924-4515>*Zaporizhzhia State Medical University***PSYCHOLOGICAL IMPACT OF QUARANTINE ON THE MEDICAL EDUCATION AND HOW TO REDUCE IT****О. П. Пахольчук, С. М. Недельська, С. В. Павлов***Запорізький державний медичний університет***ПСИХОЛОГІЧНИЙ ВПЛИВ КАРАНТИНУ НА МЕДИЧНУ ОСВІТУ ТА ШЛЯХИ ЙОГО ПОДОЛАННЯ**

**Abstract.** Previously published data on experiences of the different quarantine measures or outbreaks in the public health system related to the SARS virus, Ebola virus, Influenza infections were analyzed in the article. The aim of the article was to identify, appraise and synthesize the best available evidences from the systematic reviews for the possible psychological impact of quarantine on the learning on health care in medical university in conditions of isolation during pandemic COVID-19 and to propose approaches to solve these problems. These findings were appraised in prism of the medical education and available approaches to the e-learning of medical students. Self-experience of the Zaporizhzhia State Medical University was also included. On the background of the published results of the studies revealing the stressors some solutions for the identified problems were proposed relating to the data of the reviews. Particular attention is paid to the effect of the self e-learning on the result of the knowledge achievement. Among main stressful factors were indicated the following: fear of infection, frustrating, boredom, inability to take part in usual day-to-day activities, lack of contact with patients. Role of the teacher in reducing the burden of stress in students during quarantine was covered. Benefits and pitfalls of on-line education were assessed. The future unsolved problems were discussed.

**Key words:** quarantine; medical education; students; stress; self-regulated learning behavior.

**Анотація.** Опубліковані раніше дані про досвід різних заходів карантину чи спалахів інфекцій у системі охорони здоров'я, пов'язаних із вірусом ГРВІ, вірусом Ебола, грипом, були проаналізовані у статті. Метою статті було виявити, оцінити й узагальнити дані із систематичних оглядів можливого психологічного впливу карантину на навчання в медичному університеті в умовах ізоляції під час пандемії COVID-19 та запропонувати підходи до вирішення цих проблем. Результати оглядів були оцінені в призмі медичної освіти та наявних підходів до електронного навчання студентів-медиків. Також було включено власний досвід співробітників Запорізького державного медичного університету. Враховуючи виділені в опублікованих результатах досліджень стресори, запропоновані варіанти вирішення виявлених проблем. Особлива увага приділяється впливу навчання за допомогою електронних ресурсів на результат досягнення знань. Серед основних стресових факторів були вказані такі: страх перед зараженням, фрустрація, нудьга, неможливість брати участь у звичайній щоденній діяльності, відсутність контакту з пацієнтами. Висвітлено роль вчителя у зниженні стресового навантаження у студентів під час карантину. Оцінено переваги та негативні аспекти онлайн-освіти. Були обговорені майбутні невирішені проблеми.

**Ключові слова:** карантин; медична освіта; студенти; стрес; саморегульована навчальна поведінка.

**Introduction.** General truth is that clinical learning in the medical universities is always highly demanding for students. Self-regulated learning of medical students during the clinical years have been published in the last 5 years, suggesting a concern in the area [3, 9]. Interest to this problem was elevated with preventive

quarantine introduction in 2020. In 2017 Berkhout J. J. et al. explored the main patterns in undergraduate students' self-regulated learning behavior in the clinical environment. The five patterns varied mostly regarding goals, metacognition, communication, effort, and dependence on external regulation for learning. These discrete patterns in students' self-regulated lear-

© O. P. Pakholchuk, S. M. Nedelska, S. V. Pavlov

ning behavior in the clinical environment are part of a complex interaction between student and learning context. They suggested that developing self-regulated learning behavior might best be supported regarding individual students' needs [3]. In usual conditions when students go through a cyclic process of setting learning goals, choosing learning strategies and assessing progress towards goals they have the same conditions as residents. And as it was proposed by van Houten-Schat M. A. et al. self-regulated learning in the clinical environment is a complex process that results from an interaction between person and context [4]. But the modern problem related to the isolation is the broken link between setting of the learning goals and process of the new knowledge achievement.

**The aim** of this article is to identify, appraise and synthesize the best available evidences from the systematic reviews for the possible psychological impact of quarantine on the learning on health care in medical university and to propose approaches to solve these problems.

**Theoretical framework.** Quarantine has been implemented in the European countries since March 2020 and has a big influence on the usual life. One of the main goal of these isolation is separation of people who have potentially been exposed to COVID-19 [2]. This preventive measures influenced the usual educational process. The focus of interest is now on the need to analyze the pitfalls and benefits of the quarantine in medical education and to find solutions basing on the background of the recent studies. The first days after quarantine implementation showed difficulties and inability of part of students to continue in the regimen of the self-regulated education. But on the other hand it was clearly understood that the time of isolation would be longer than a week and some new approaches are needed to shape the educational process in order not to lose the main goals and not to have decrease of the educational level. In this regard the evidences of the main stressors during quarantine were analyzed.

Previous experiences of the quarantine measures or outbreaks in the public health related to the SARS, Ebola, Influenza infections were analyzed and some tendencies in the psychological changes were identified. In the review by Brooks S. K. et al. (2020) the most recent studies in psychology in the COVID-19 conditions were analyzed. Among reported negative psychological effects of the quarantine were as follows: post-traumatic stress symptoms, confusion, and anger [6].

Wallenburg I. et al. indicated that various aspects of the modernization process are valued differently by

stakeholders, highlighting important sources of agreement and disagreement between them. An important source of disagreement is diverging expectations of the role of physicians in modern medical practice [1]. In this regard fears of infection which students may be in conflict with usual beliefs related to the medical care. Studies showed that many participants cited poor information from public health authorities as a stressor, reporting insufficient clear guidelines about actions to take and confusion about the purpose of quarantine [6, 7]. Better quality and quantity of the correct information on the University's sources could solve both these issues. Especially this data is needed by the foreign students. As it was revealed by the review participants also reported a perceived lack of transparency from health and government officials about the severity of the pandemic [10]. As it was stressed by Brooks S. K. et al. (2020) reinforcing that quarantine is helping to keep others safe, including those particularly vulnerable (such as those who are very young, old, or with pre-existing serious medical conditions), and that health authorities are genuinely grateful to them, can only help to reduce the mental health effect and adherence in those quarantined [6]. Role of the teacher during quarantine should include psychological support as students the same time become subjects of the measures to stop the pandemic.

Other stressors during quarantine which students face with are frustration and boredom [6]. These feelings hardly could appear during usual educational process with going through a cyclic process, but loss of usual routine, and reduced social and physical contact with others were frequently shown to cause boredom, frustration, and a sense of isolation from the rest of the world [6, 8, 10]. This problem is related with other finding. Being in everyday contact with teacher in this focus become not necessary only for education but for the public support also. Studies showed that this frustration was exacerbated by not being able to take part in usual day-to-day activities, such as shopping for basic necessities and or taking part in social networking activities via the telephone or internet [6]. Introduction of the on-line sessions of the interaction with teacher via internet programs could decrease this burden and could give other benefits. Because other big challenge for medical education during isolation is lack of contact with patients and inability to form practical skills. Also it would be helpful to launch educational videos demonstrating interaction with patients in real clinical practice. The effect of the e-learning of medical subjects was analyzed by Sinclair P. et al. (2015)

in systematic review. Terms such as computer-assisted learning, online learning, web-based learning and e-learning are often used synonymously but all reflect knowledge transfer via an electronic device. They named person-to-person interactivity is an important enabler of knowledge generation and suggested that a multi-modal intervention may be required in order to reduce excessive recall rates, rather than a single intervention. Pape-Koehler et al. and Smeekins et al. reported positive findings using randomized controlled designs to test the efficacy of e-learning interventions

on individual's surgical performance and the detection of child abuse, respectively. Smeekins et al. demonstrated that a 2 hour e-learning program improved nurses' ability to detect child abuse in an emergency department. For this reason, the e-learning research agenda in health should focus on whether knowledge generated through e-learning is able to be re-contextualized into clinical practice, and influence sustained clinical behavior change and patient outcomes [5].

The identified psychological problems and proposed solutions were summarized in Table 1.

**Table 1.** The elements of psychological impact of quarantine on the clinical learning and proposed solutions

Identified problems	Proposed solutions
Fears of infection	Give as more as possible correct information on the open University's sources
Boredom	Clear transparent curriculum with possible correction regarding quarantine and step-formed goals
Frustration	Everyday effective and rapid communication with teacher during all learning cycle
Lack of contact with patients, inability to form practical skills	Real-time interaction with teacher via internet programs; Focus e-learning agenda on whether knowledge is generated

**Conclusions and Prospects for Research.** Thus, psychological impact of quarantine on the medical education is multiple forms. Stressful aspect should be taken into the consideration in order to keep the level and qualitative parameters of education. The unsolved problem remains postquarantine psychological

outcomes which are still not known as they may appear in some time after stop of the measures. The same time researchers do not provide strong evidence that any particular demographic factors are risk factors of poor psychological outcomes after quarantine and therefore require specific attention.

#### List of literature

1. Between trust and accountability: different perspectives on the modernization of postgraduate medical training in the Netherlands / I. Wallenburg, J. van Exel, E. Stolk [et al.] // *Acad. Med.* – 2010. – Vol. 85 (6). – P. 1082–1090. DOI:10.1097/ACM.0b013e3181dc1f0f.
2. Centers for Disease Control and Prevention. Quarantine and isolation. – Accesed mode : <https://www.cdc.gov/quarantine/index.html>.
3. Patterns in clinical students' self-regulated learning behavior: a Q-methodology study / J. J. Berkhout, P. W. Teunissen, E. Helmich [et al.] // *Adv. Health Sci. Educ. Theory Pract.* – 2017. – Vol. 22 (1). – P. 105–121. DOI:10.1007/s10459-016-9687-4.
4. Self-regulated learning in the clinical context: a systematic review / M. A. van Houten-Schat, J. J. Berkhout, N. van Dijk [et al.] // *Med. Educ.* – 2018. – Vol. 52 (10). – P. 1008–1015. DOI:10.1111/medu.13615.
5. Sinclair P. The effectiveness of internet-based e-learning on clinician behavior and patient outcomes: a systematic review protocol / P. Sinclair, A. Kable, T. Levett-Jones // *JBHI Database System Rev. Implement. Rep.* – 2015. – Vol. 13 (1). – P. 52–64. DOI:10.11124/jbisrir-2015-1919.

6. The psychological impact of quarantine and how to reduce it: rapid review of the evidence / S. K. Brooks, R. K. Webster, L. E. Smith [et al.] // *Lancet.* – 2020. – Vol. 395, Issue 10227. – P. 912–920. DOI: [https://doi.org/10.1016/S0140-6736\(20\)30460-8](https://doi.org/10.1016/S0140-6736(20)30460-8).
7. The psychosocial effects of being quarantined following exposure to SARS: a qualitative study of Toronto health care workers / E. Robertson, K. Hershenfield, S. L. Grace, D. E. Stewart // *Can J. Psychiatry.* – 2004. – Vol. 49. – P. 403–407.
8. The public's response to severe acute respiratory syndrome in Toronto and the United States / R. J. Blendon, J. M. Benson, C. M. DesRoches [et al.] // *Clin. Infect. Dis.* – 2004. – Vol. 38. – P. 925–931.
9. The self-regulated learning of medical students in the clinical environment – a scoping review / K. K. Cho, B. Marjadi, V. Langendyk, W. Hu // *BMC Med Educ.* – 2017. – Vol. 17 (1). – P. 112. DOI:10.1186/s12909-017-0956-6.
10. Understanding the school community's response to school closures during the H1N1 2009 influenza pandemic / A. Braunack-Mayer, R. Tooher, J. E. Collins [et al.] // *BMC Public Health.* – 2013. – Vol. 13. – P. 344.

## References

1. Wallenburg, I., van Exel, J., Stolk, E., Scheele, F., de Bont, A., & Meurs, P. (2010). Between trust and accountability: different perspectives on the modernization of post-graduate medical training in the Netherlands. *Acad. Med.*, 85(6), 1082-1090. DOI:10.1097/ACM.0b013e3181dc1f0f.
2. Centers for Disease Control and Prevention. Quarantine and isolation (2017). Retrieved from: <https://www.cdc.gov/quarantine/index.html>.
3. Berkhout, J.J., Teunissen, P.W., Helmich, E., van Exel, J., van der Vleuten, C.P., & Jaarsma D.A. (2017). Patterns in clinical students' self-regulated learning behavior: a Q-methodology study. *Adv. Health Sci. Educ. Theory Pract.*, 22(1), 105-121. DOI:10.1007/s10459-016-9687-4.
4. van Houten-Schat, M.A., Berkhout, J.J., van Dijk, N., Endedijk, M.D., Jaarsma, A.D.C., & Diemers, A.D. (2018). Self-regulated learning in the clinical context: a systematic review. *Med. Educ.*, 52 (10), 1008-1015. DOI:10.1111/medu.13615.
5. Sinclair, P., Kable, A., & Levett-Jones, T. (2015). The effectiveness of internet-based e-learning on clinician behavior and patient outcomes: a systematic review protocol. *JBI Database System Rev. Implement Rep.*, 13 (1), 52-64. DOI:10.11124/jbisrir-2015-1919.
6. Brooks, S.K., Webster, R.K., Smith, L.E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, J.G. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet*, 395 (10227), 912-920. DOI: [https://doi.org/10.1016/S0140-6736\(20\)30460-8](https://doi.org/10.1016/S0140-6736(20)30460-8).
7. Robertson, E., Hershenfield, K., Grace, S.L., & Stewart, D.E. (2004). The psychosocial effects of being quarantined following exposure to SARS: a qualitative study of Toronto health care workers. *Can. J. Psychiatry*, 49, 403-407.
8. Blendon, R.J., Benson, J.M., DesRoches, C.M., Raleigh, E., & Taylor-Clark, K. (2004). The public's response to severe acute respiratory syndrome in Toronto and the United States. *Clin. Infect. Dis.*, 38, 925-931.
9. Cho, K.K., Marjadi, B., Langendyk, V., & Hu, W. (2017). The self-regulated learning of medical students in the clinical environment – a scoping review. *BMC Med. Educ.*, 17 (1), 112. DOI:10.1186/s12909-017-0956-6.
10. Braunack-Mayer, A., Tooher, R., Collins, J.E., Street, J.M., & Marshall, H. (2013). Understanding the school community's response to school closures during the H1N1 2009 influenza pandemic. *BMC Public Health*, 13, 344.

Received 08.06.20  
Recommended 12.06.20

E-mail address for correspondence: [olgapakholchuk@gmail.com](mailto:olgapakholchuk@gmail.com)