BIOMEDICAL RESEARCHERS CONFRONTING THE COVID-19 PANDEMIC

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Abstract

The COVID-19 pandemic represents a global challenge to be confronted by the biomedical community. This article aimed to explore how knowledgeable and competent researchers may contribute to fighting the pandemic, and to discuss the ethics and impact of this endeavor. Many medical researchers and in particular clinical practitioners are engaged in collecting new evidence and creating new knowledge by undertaking pandemic-related research. This research is frequently unplanned, and subsequently numerous obstacles to starting new but necessary studies must be overcome. To contribute research evidence in hard times represents a highly ethical move. Moreover, these new studies need ethical approvals, financial resources, and institutional frameworks. Another pandemic-related challenge is how to generate expert opinions during the period when solid evidence is missing. Unlike research studies providing necessary scientific evidence, expert opinions do not need ethical approvals or disclosures of competing interests. The apparent contrast of evidence-based versus opinion-based decision-making during the pandemic reconfirms that quality research studies have no alternatives at all times.

Keywords: Pandemic, Scientific Method, Expert Opinion, Experimental Evidence, Research Study

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The ongoing COVID-19 pandemic is a devastating disaster that continues to negatively affect humanity and create a humanitarian catastrophe in most parts of the world [1]. As the cause of this pandemic is a biological entity, SARS-CoV-2, understanding how the disease spreads, describing its features, and developing effective and safe preventive measures may offer a solution to the disaster of global proportions. The key to stopping the pandemic and saving humanity is in the hands of biomedical researchers who generate testable hypotheses, undertake research studies, and provide the necessary evidence and new knowledge for this

purpose. While the world witnesses new waves of the pandemic and struggles to control the emergence of SARS-CoV-2 variants and the spread of infection, biomedical researchers are urgently developing vaccines aimed at not only saving lives, but also creating herd immunity and stopping the pandemic [2]. In fact, it is high time for researchers who mobilize all their intellectual resources to save humanity, solve the emerging socioeconomic issues, and contribute to global prosperity. Advanced knowledge and research skills are now in high demand to emerge victorious in the war against a biological threat.

All researchers are proud to belong to a societal group that generates and tests ideas by experiments to create new evidence and find solutions of global importance. This collective contribution of science to humanity strengthens the position of researchers in the society and justifies publicly funded research studies across the world [3]. However, a question arises regarding the role of (biomedical) researchers who are involved in routine works and are far from “rocket science”.

Undoubtedly, the number of elite researchers who create and validate effective measures against the pandemic is limited. Epidemiologists, virologists, and vaccine researchers are currently at the forefront of the battle against the ongoing pandemic. However, there is also an army of biomedical researchers who describe and predict various manifestations of COVID-19 and who conduct experiments with numerous drug therapies. Their works often remain overlooked and unappreciated. This is as well frequently in contrast with their high skills and deep understanding of their particular fields. The impact of their noble efforts to contribute to the body of research necessary to confront the ongoing threat needs to be recognized and respected [4].

As the pandemic evolves, numerous pathophysiological mechanisms and systemic clinical manifestations of COVID-19 are reported, pointing to the essential role of researchers with interest in various theoretical and clinical disciplines. For example, although the virus is neurotropic, the virus-brain interaction and its immediate effects on the human organism are only a minor part of the consequences of the viral infection. Nevertheless, the level of interaction of the brain and nervous system with other organ systems and its contribution to the pathophysiological aspects of disease need to be clearly identified and understood [5].

This article aimed to explore how knowledgeable and competent researchers may aid in fighting the COVID-19 pandemic, and discuss the ethics and impact of this endeavor.

The initial stage of the pandemic was characterized by the lack of relevant research studies and insufficient empirical data. During this stage, there was an urgent need to describe individual cases and analyze COVID-19 cohorts to categorize the disease and conduct

experiments with (repurposed) anti-inflammatory and immune-suppressing drug therapies [6]. Clinicians, who risked their lives at the hospital settings and observed the deadly consequences of the infection among the elderly, immunocompromised, and hyper-reactive subjects, collected the initial evidence. These opened new avenues to be complemented by subsequent studies in much safer conditions. A large volume of such studies included online surveys among allied health specialists and patients who provided the public with essential empirical data [7]. Other studies, including our own cross-sectional study in March 2020, revealed several aggravating psychosocial and mental health factors during the early phase of the COVID-19 pandemic, and described the effects of the pandemic to the public at large [8].

Online surveys and descriptive studies were urgently conducted by researchers who suspended all other research works and concentrated on COVID-19. Some of these urgent research efforts lacked adherence to any reporting standards and were hastily authorized by ethics committees. Accordingly, there were also some published and unpublished works (preprints) which did not stand the critical evaluation of readers and faced retractions [9].

One of the main challenges at the initial stage was the lack of time and funding for large-scale and well-powered studies. Most devoted and flexible researchers dedicated their precious time to urgent COVID-19 projects with limited or no funding. As a result, priorities for exploring new scientific directions, research management, and scholarly cooperation changed. Consequently, a number of new obstacles emerged, necessitating the suspension of previously approved and funded research projects, the hiring of new research fellows, and the expansion of international cooperation.

Although several funding agencies currently offer fast evaluation of new COVID-19 projects, not all biomedical researchers with interest in the subject are sufficiently skilled to apply and successfully compete for grants. There are also specialists who wish to finalize their previous, non-COVID-19 projects and try to stay fit despite the restrictions and lockdowns. Successful or flexible researchers continue to explore new scientific avenues and find new opportunities even during these

hard times, including publishing preprints and online blogs, and sharing results on social media [10]. Their success is primarily due to proper research management at academic and research institutions with established routines and readiness to rapidly respond to emerging threats.

Despite all current challenges and restrictions, what remains unchanged is the requirement to ethically plan and conduct research, and adhere to all ethical norms. When it comes to ethics, no compromise is acceptable in these times. All research studies involving human and animal subjects need an ethical approval and related standard procedures [11]. Some surveys or information analytical studies during the COVID-19 pandemic may be exempted from full ethical reviews, with an official waiver granted. Ethics approval or a waiver should be obtained at the start of any research to avoid delays in data collection and analysis [12].

One of the main challenges at the initial stage of the pandemic was how to evaluate expert opinion in the absence of solid evidence and in view of ethical uncertainties. Expert opinion has been in demand over the past year [13]. In particular, expert reviews of repurposed drug therapies and vaccines have allowed the recommendation of hydroxychloroquine and MMR vaccination as potential therapeutic and preventive options during the pandemic [14]. While the clinical implications of such reviews are uncertain, there are ethical concerns over the risks of non-specific drug therapies [15].

The definition of expert opinion itself is puzzling. The European Centre for Disease Prevention and Control, an official agency of the EU, states that “expert opinions are scientific views or comments by a group of designated experts based on a review of scientific evidence and/or expert opinion” [16]. This is a good example of the confusions surrounding the terms expert and opinion. At the outset, the definition is circular: “expert opinions are... based on... expert opinion.” Another confusing point is that per definition, expert opinions are “scientific views or comments”, implying that scientific methods are within the origin of expert opinions. “A review of scientific evidence” can be arranged in many ways, and only systematic reviews are based on systematic research.

As such, expert opinion is a non-systematic overview which may be based on poor quality and underpowered studies or individual observations.

The uncertainties with expert opinion definitions have created major ethical issues in the time of the pandemic. Some eminent expert guesses and unfounded speculations, which were rapidly disseminated via journals, news outlets, and social media, caused misconceptions and resulted in unethical uses of some drugs such as hydroxychloroquine or confusion on simple protective tools as face masks [17, 18, 19]. All opinion-based statements, publications, and online dissemination did not require ethical approval. There was also no obligation to disclose competing interests which could point to unethical commercial interests of some “experts” [20].

An important question arises as to whether the scientific community and the public need expert opinion at the time of limited knowledge of and scarce evidence on COVID-19. Explanations of biomedical experts could be helpful when there is a need to solve complex scientific issues and when available evidence-based data are conflicting. Nonetheless, the explanations of experts without any supporting powered research studies are merely guesses and not points for implementing in practice [21].

The COVID-19 pandemic has raised an ethical issue of proactive individual researchers in critical times for the society. What are the ethical requirements for researchers when urgent but non-evidence-based actions are required? Peer evaluators of these publications and the public at large should be provided with transparent means for accessing primary data and analyses. If evidence is missing, opinion-based actions are apparently inevitable. However, only evidence-based decisions are to be relied on. Arguably, quality research studies have no alternatives at all times.

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CONFLICTS OF INTEREST

The author has no potential conflicts of interest to disclose.

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COVID-19 ПАНДЕМИЯСЫНА ЖАУАП БЕРЕТІН БИОМЕДИЦИНАЛЫҚ ЗЕРТТЕУШІЛЕР**Түйіндеме**

COVID-19 пандемиясы - бұл биомедициналық қауымдастық алдында тұрған жаһандық мәселе. Бұл мақаланың мақсаты - пандемиямен күресуде құзыретті зерттеушілердің ықпал ете алатын тетіктерін зерттеу. Қазіргі кезде көптеген медициналық зерттеушілер және, атап айтқанда, дағдыланған дәрігерлер пандемияға байланысты мәліметтер жинап, зерттеулер жүргізуде. Бұл зерттеулер көбінесе жоспарланбаған болып келеді, сондықтан оларды жүзеге асыруда көптеген кедергілер байқалады. Осы қиын кезеңдерде зерттеу деректерін ұсыну жоғарғы дәрежелі этикалық қадам болып саналады. Алайда, жүргізілетін зерттеулер этикалық нормаларының мақұлдауын, қаржылық ресурстарды және жаңа институционалдық құрылымды қажет етеді. Пандемияға қарсы тағы мәселенің бірі - нақты дәлелдер болмаған жағдайда сарапшылардың тұжырымдамаларын қалай жасау керектігі. Қажетті ғылыми дәлелдерді ұсынатын зерттеулермен салыстырғанда сарапшылардың пікірлері этикалық мақұлдауды немесе бәсекелес мүдделер туралы ақпаратты ашып көрсетуді қажет етпейді. Нақты деректер негізінде және пандемия кезінде шешімдер қабылдаудың айқын қарама-қарсылығы қандай да бір жағдайда ғылыми зерттеулердің сапасына нұқсан келтірмеуі тиіс екендігін дәлелдейді.

Түйінді сөздер: пандемия, ғылыми әдіс, сарапшылардың пікірі, эксперименттік мәліметтер, зерттеу.

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БИОМЕДИЦИНСКИЕ ИССЛЕДОВАТЕЛИ ПРОТИВОСТОЯТ ПАНДЕМИИ COVID-19**Резюме**

Пандемия COVID-19 представляет собой глобальную проблему, с которой столкнулось биомедицинское сообщество. Целью данной статьи является изучения механизмов, с помощью которых компетентные исследователи могут внести свой вклад в борьбу с пандемией. Многие медицинские исследователи и, в частности, практикующие врачи сегодня занимаются сбором данных и проведением исследований, связанных с пандемией. Эти исследования часто являются незапланированным, и, следовательно, на пути их реализации наблюдаются многочисленные препятствия. Предоставление исследовательских данных в столь трудные времена — это в высшей степени этический шаг. Однако проводимые исследования нуждаются в одобрении этических норм, финансовых ресурсах и новой институциональной структуре. Еще одна проблема, связанная с пандемией, заключается в том, как составлять экспертные заключения в условиях отсутствия убедительных доказательств. В отличие от исследований, предоставляющих необходимые научные доказательства, мнения экспертов не требуют этических одобрений или раскрытия информации о конкурирующих интересах. Очевидный контраст принятия решений на основе фактических данных и во время пандемии подтверждает, что качество научных исследований не должно страдать ни при каких условиях.

Ключевые слова: пандемия, научный метод, заключение экспертов, экспериментальные данные, исследование.

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Graphical Abstract

Графикалық түйіндеме

Графическое резюме

Biomedical researchers confronting the COVID-19 pandemic