

Effect of COVID-19 Pandemic on Teachers' Health: Lessons for Improving Distance Education

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Abstract: The transition to distance education has led to deterioration in the health of teachers and students. The purpose of the study was to identify controlled factors of the educational environment, the impact of which in an emergency situation due to a pandemic on infectious disease can be influenced by the administration of general secondary education institutions. Material and methods: 339 teachers and 828 parents of general secondary schools of Mykolaiv region (Ukraine) took part in research from May to June 2021. The research tool was a self-administered survey questionnaire. The study found that social networks were the leading source of information on the COVID-19 pandemic situation for educators. The vast majority of educators indicated that they follow certain rules of conduct in order not to get sick. Most respondents admitted that they experienced weakness, mood swings, depressed thoughts, anxiety and tension due to the situation with the COVID-19 pandemic. Mostly more fatigue, hypodynamics and impaired vision were considered by teachers as manifestations of deteriorating physical condition. Manifestations of psychological deterioration, according to teachers, were greater aggression, agitation, signs of depression and emotional instability. The key factors in preventing the deterioration of teachers' health in the event of an infectious disease pandemic, which can be influenced by the administration of general secondary education institutions, include: reducing the workload of teachers during distance education; conducting professionally oriented education of teachers in the field of health technologies; increasing the level of information competence of teachers; improving the technological base of schools for distance learning.

Keywords: *COVID-19; pandemic; anxiety; risk; teachers; students.*

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Introduction

There has been a deteriorating health of teachers around the world over the past two years. This is especially true for those teachers who are over 40 years old. Yang, You, Yu, Ling & Feng (2019) point to the decline in the health of teachers in recent years, associated with social instability, economic crisis, deteriorating health care, work overload.

The existing literature indicates that teachers have faced many difficulties caused by the rapid and unexpected transition to distance education. Thus, it is a complex home environment, information gap, inexperience in the latest information platforms, significant increase in working hours, inequality and rising poverty (Carrillo & Flores, 2020; Bozkurt & Sharma, 2020; Alasoluyi, 2021; Jerrim & Sims, 2021; Shipton, McCartney & McMaster, 2021).

Such difficulties as fear of uncertainty in the future, financial problems, lack of physical activity, nervous tension, stress, irregular working hours, limited mobility, abrupt transition to remote work affected teachers during the COVID-19 pandemic. To prevent difficulties in organizing unlimited distance learning, it is important to know how teachers feel, what new experiences they gain, how they realize the value of life and health, what is their attitude to the prevention of infectious diseases in an acute threat to their lives and health. It should be noted that teachers, due to the fact that they work with young people, can further minimize the consequences of the pandemic for future generations. The scientific research indicated: «High acceptance of a COVID-19 vaccine among teachers will be important to minimizing disruptions to schooling, and ensure the safety of teachers, especially those at high-risk for severe illness due to COVID-19. A focus on the uptake in teachers is also important given that COVID-19 vaccines have not yet been approved for children, and given vaccine roll-out to date, children may be the last to receive a vaccine against COVID-19» (Sarai Racey et al, 2021, p. 2). It should also be noted the need to change the behavioral responses of both the general population and the teachers themselves, who must comply with the requirements of «careful behavior» (Usherwood, LaJoie & Srivastava, 2021).

Thus, it is important to conduct research that would further serve as an additional new source of information for better preparation and conducting of distance classes. We focus on the physical and psychological health of teachers, which forces them to adapt to distance teaching. However, it is important for administrative staff to accept and understand the specifics of workload planning, restructuring the content, forms and methods of teaching, developing models of behavior of teachers, students

and parents at a distance, understanding the tool of vaccination (COVID-19 Vaccines for Teachers, School Staff, and Childcare Workers, 2021), and that is one of the most important factors - improving the technological base of schools. Thus, O.E. Alasoluyi indicates: «In seeking to understand teachers' competence in the switch from traditional classroom – based to online teaching, findings revealed that although teachers are reasonably aware of the shift, but do have low competence due to a lack of technological resources» (Alasoluyi, 2021, p. 29).

Therefore, this study is necessary to inform the subjects of the educational space about the impact of the pandemic on the performance of teachers' professional duties. This will help to understand what forms of professional activity were unusual, what bothered teachers and what may be the future consequences of online teaching for them as professionals. Thus, in this paper we provide an overview of the scientific literature on existing practices to prevent deterioration of teachers' health during distance learning and the results of a teacher survey on the situation with the COVID-19 pandemic in schools of Mykolaiv region, Ukraine.

There are many different concepts in the current literature on how to prevent the deterioration of teachers' health. This is primarily the prevention of diseases and disorders related to the psycho-emotional state of teachers in various fields of education, which deteriorates due to increased sympathetic effects of the autonomic nervous system on the body, cardiac arrhythmias (Dolgova & Mamylyna, 2018; Junker, Donker & Mainhard, 2021), prevention of respiratory disorders (Chotirmall et al., 2021), decreased cognitive performance (Belousova, Dolgov & Maltsev, 2019).

A detailed analysis of different approaches to the preventive work of educators is beyond the scope of the work. Chotirmall, Leither, Coruh, Chan, Joudi, Brown, Singer, and Seam (2021), for example, refer to distance education opportunities as necessary process required for adult education and necessary for its continuation after the COVID-19 pandemic. In this review, we focus on the well-being of secondary school teachers who teach and interact with students who need to work remotely. In this context, the issues of careful planning of working hours, the responsibility of school administrations for the health of teachers, the possibility of introducing the principle of flexibility of educational courses are key elements for the introduction of healthy work technologies. Given that the educational process with secondary school students is specific due to personal changes that occur in middle school age, it is also necessary to determine the willingness of teachers to take into account the well-being of students who study in the current distance format. It should be added that students

themselves, according to scientific research, in certain circumstances perceive schooling as the main source of stress and deterioration of mental health. The situation is also complicated by the imbalance between the school's requirements for students and the existing resources of the educational process, the growing school pressure on students, which is associated with high academic requirements for school tasks, etc. (Högberg, 2021; Löfstedt et al., 2020).

It is important to make effective use of the potential of digital technologies as mitigating the impact of the pandemic on the health and well-being of the population, but should also take into account studies that emphasize the importance of investing in reliable telecommunications infrastructure to bridge the digital divide globally and at the local level (Katz, Jung & Callorda, 2020).

For the protection of public health, it was necessary to move to distance education, which was introduced in most general secondary education institutions, but such a transition had a great impact on the deterioration of the health of teachers and students (Torliński et al., 2020). Discussions on how to organize distance work, how to restructure the educational process - seems comprehensive. Teachers also need to become more aware of both the world of digital technologies, in particular their effective use, and be prepared to change their behavior, in particular with regard to improving their mental and physical condition. The administration of educational institutions should be ready to make management decisions regarding the organization of the educational process in the conditions of general distance learning, the organization of preventive measures to preserve the health of teachers, which already has a significant impact on the healthy future of the younger generation.

The purpose of the study was to identify controlled factors of the educational environment, the impact of which in an emergency situation due to a pandemic on infectious disease can be influenced by the administration of general secondary education institutions.

Materials and methods

Teachers and parents of general secondary education institutions in the Mykolaiv region (Ukraine) were invited to take part in an online survey from May to June 2021. The administrative staff of general secondary schools, as well as the technical staff, were not invited to conduct the online survey.

The study involved 339 teachers and 828 parents of secondary schools of Mykolaiv region. Among the teachers - 30 men (8.8%) and 309 -

women (91.2%); 110 teachers were from Mykolaiv, 107 – from small towns (district centers), 122 – from rural areas. The average age of respondents was 45.3 years (41.1 - among men and 45.7 years - among women). Among the parents were 440 men and 388 women. All respondents agreed to the processing of personal information.

In June 2021, a descriptive analysis of the data was conducted.

Results

In the answers, 11.5% of respondents identified themselves as a «primary school teacher», 80.8% - as a «teacher» (1.5% - teachers of English; 0.6% - teachers of Biology/Chemistry; 0.9 % teachers of Geography, 0.9% - teachers of Foreign literature; 0.6% - teachers of Computer Science; 0.3% - teachers of History; 1.2% - teachers of Mathematics; 1.2 - teachers of Fine Arts and Choreography; 1.2% - teachers of Ukrainian Language/Literature) and 7.7% were referred to the group «other staff» (0.9% - educators of the extended day group; 3.5% - teacher’s assistant; 2.1% - psychologists, social pedagogues, speech therapists).

The leading sources of information on the pandemic situation at COVID-19 for teachers, regardless of gender and place of residence, were social networks (72.9% of respondents) and newspapers / television (65.8% of respondents). Given the appropriate structure of significant sources among parents, their interest in the pandemic situation was much lower (Table 1). At the same time, if only 2.1% of teachers focused on doctors or health professionals as a significant source of information, among parents their significance was much higher (16.2%, $p < 0.001$).

Table 1. The share of significant sources of information on the situation with the pandemic COVID-19 among participants in the educational process.

Indicators of the structure of responses	Teachers			Parents		
	In general (n=339)	Male (n=30)	Female (n=309)	In general (n=828)	Male (n=440)	Female (n=388)
Websites	51,3±2,7#	70,0±8,5##*	49,5±2,7##*	21,0±1,4	18,4±1,8*	24,0±2,2
Social networks	72,9±2,4#	63,3±8,9	73,8±2,3#	58,1±1,7	56,8±2,4	59,5±2,5
Newspapers, TV	65,8±2,6#	63,3±8,9#	66,0±2,5#	37,3±1,7	38,6±2,3	35,8±2,4
Colleagues	28,6±2,5	20,0±7,4	29,4±2,4	-	-	-

Doctor	2,1±0,6#	0±0	2,7±0,7	16,2±1,3	18,4±1,8*	13,7±1,7
I'm not interested	4,1±1,1#	6,7±4,6	3,9±0,5	14,4±1,2	14,8±1,7	13,9±1,8

* p < 0,05 between indicators of men and women;
p < 0,05 between indicators of teachers and parents

Websites were also an important source of information, the perception of which depended significantly on the place of residence and gender of teachers. Websites were more trusted among men (70.0% of respondents) than among women (49.5% of respondents), and in small towns (54.7% of respondents) than in the regional center (41.0%) and rural area (30.8%).

Colleagues were trusted as a source of information for teachers more in a large city (35.9% of respondents) than in a small town (29.6% of respondents) or in rural areas (15.4% of respondents).

The vast majority of teachers (80.8%) indicated that they follow certain rules of conduct in order not to get sick, and from 10.9% in the regional center to 24.6% in rural areas admitted that they do not always follow the established rules. Similar trends are typical for parents, which indicates the awareness of existing threats by all participants in the educational process.

31.9% of the educators admitted that they had COVID-19. 28.9% of teachers' families also had COVID-19, and 2.7% had severe atypical pneumonia (COVID-19 tests failed). Only 37.2% of teachers denied the likelihood of contracting COVID-19 in their family, while 63.1% of parents ($p < 0.001$) acknowledged the absence of patients. That is, in 1.7 times the risk of disease in the families of teachers is higher than in families with school-age children.

Weakness, as a manifestation of the negative impact of the pandemic on the physical condition, was recognized by 45.5% of teachers in the regional center, 39.3% - in small towns and 50.0% in rural areas. Mood swings, depressive thoughts as a manifestation of the impact on the emotional state recognized 56.4% in a large city, 45.8% - in small towns and 60.7% - in rural areas. At the same time, 76.4% of teachers acknowledged feelings of anxiety and tension due to the situation with the COVID-19 pandemic, and women perceive the situation more emotionally unfavorably (36.7% of men and 56.3% of women admitted emotional problems; $p = 0.039$).

Concerns during quarantine among teachers were caused by their health status (65.5% of respondents), the threat of illness of relatives

(86.1%), deterioration of family wealth, financial restrictions (20.6%), restrictions on communication with friends and relatives (31.3%), transport restrictions and their overcoming (35.7%), difficulties in accessing medical care (44.5%), change in the usual mode of work (38.6%), excessive food intake (8.0 %), restriction of motor activity (21.2%), education of the child in the online format (27.2%) (Table 2). And only 3.8% pointed to tense domestic relations, quarrels in the family, and 8.0% to the need to pay more attention to the organization of the child's education.

Table 2. The share of problems identified by participants in the educational process during the pandemic COVID-19

Indicators of the structure of responses	Teachers			Parents		
	In general (n=339)	Male (n=30)	Female (n=309)	In general (n=828)	Male (n=440)	Female (n=388)
Health status	65,5#	63,3	65,7	30,8	30,5	31,2
The threat of disease of relatives	86,2#	86,7	86,1	72,6	73,4	71,7
Deterioration of family wealth	20,7#	16,7	21,0	30,0	30,0	30,2
Family quarrels	3,8	0,0	4,2	5,3	5,0	5,7
Restrictions on communication	31,3	36,7	30,7	24,0	22,1	26,3
Transport restrictions	36,0#	30,0	36,6	25,6	25,9	25,3
Availability of medical care	44,8#	33,3*	45,9	24,0	25,5	22,4
Excessive food intake	8,3	16,7	7,4	5,4	6,1	4,6
	21,5	30,0	20,7	22,2	22,1	22,4
Restriction of motor activity	28,0#	33,3	27,5	62,4	66,1	58,3
Teaching a child online						
Organization of the child's education	8,3#	3,3	8,7	23,0	26,8	18,6

* $p < 0,05$ between indicators of men and women;

$p < 0,05$ between indicators of teachers and parents

The vast majority (83.3%) of teachers acknowledged that the pandemic did not affect their professional responsibilities. At the same time, 27.1% of teachers considered telephone consultations, 33.0% - video consultations, 27.1% - on-line presentations and 16.2% - communication via

e-mail to be unusual forms of professional activity. Only a fifth of teachers (30.8% in primary school, 17.2% - primary school teachers, 23% - among «the other» teaching staff) admitted that the workload has not increased significantly, and 13% - could not determine .

An increase in the time of preparation for lessons during distance learning for 1 hour was recognized by 11.2% of teachers, for 2-3 hours - 36.9%, for 4 or more hours - 19.5% (especially among primary school teachers - 20.8 %, against the background of 12.8% among primary school teachers).

8.0% of teachers associated adverse changes with health and distance learning, and 45.7% of teachers - with excessive stress, persistent fatigue (which can be seen as signs of fatigue). 24.8% admitted that they periodically get tired. Among those who could not determine the impact of distance classes on their condition, 64.3% were those who had had COVID 19. So it can be assumed that they are not ready to differentiate what more affected their condition - disease or workload.

There are no significant differences in the perception of adverse health changes associated with preparation for distance learning. Slightly fewer teachers (7.7%) reported deteriorating health, 41.9% reported excessive stress, persistent fatigue, and 27.7% reported periodic fatigue.

The financial situation of 19.5% of teachers has deteriorated and 80.2% believe that the situation has not changed significantly. When assessing the situation with students, 43.1% of teachers acknowledged the deterioration of students' physical condition and 42.8% - psychological condition. Mostly more fatigue, hypodynamics and impaired vision were considered by teachers as manifestations of deteriorating physical condition. Manifestations of psychological deterioration, according to teachers, were greater aggression, agitation, signs of depression and emotional instability.

Only 8.3% of teachers believe that they did not gain any new experience during the pandemic. Important new experiences include conducting lessons remotely and communicating on-line, realizing the value of life and health.

At the same time, only 66.4% of teachers consider it appropriate to vaccinate against the background of 44.7% of parents ($p < 0.01$).

Discussion

Distance working requires teachers to increase the period of preparation for lessons. However, this is not taken into account in the workload and causes intermittent fatigue. Working in a static mode with the means of communication worsens the physical condition, accompanied by

hypodynamics, impaired vision. Also in the conditions of distance learning the psychological condition of both students and teachers themselves deteriorates. As a result aggression, agitation, depression, emotional instability appears. Scientists have found that the pandemic, in addition to threatening human life, has caused great economic damage and proved to be an outright catastrophe in some countries (Oduro & Magagula, 2021; Killeen & Kiware, 2020; Prem, et al., 2020; Mofijur, et al., 2021). Prolonged school closures, physical distancing, limited travel - all this has changed the usual pace and rhythm of life. This has caused great concern among all sections of the population, as well as among teachers themselves. However, we have noted that most teachers believe that the pandemic has had little effect on their professional responsibilities.

Studying the information about the state of teachers during distance education, their well-being and attitude to their own health gives grounds to provide recommendations. This includes maintaining a healthy lifestyle, increasing active exercise, and implementing health technologies. School administrators should develop a positive attitude towards health-promoting behavior, its cultivation in both teachers and students. Such work should be checked, systematically assessed for physical and mental health, and preventive measures should be taken, including various health-improving exercises.

Conclusions

The identified data are important for the timely resolution of occupational safety issues of teachers, caused by the unprecedented introduction of distance education during the pandemic COVID-19. The data will be able to provide timely support for school administrations to make management decisions to improve the technological base of teaching, reduce the workload of teachers, implement organizational measures to improve the psychological and physical health of both teachers and students, increase teachers' awareness of compliance with established rules of conduct etc.

The key factors in preventing the deterioration of teachers' health in the event of an infectious disease pandemic, which can be influenced by the administration of general secondary education institutions, include: reducing the workload of teachers during distance education; conducting professionally oriented education of teachers in the field of health technologies; increasing the level of information competence of teachers; improving the technological base of schools for distance learning.

In the near future, the administrative staff of general secondary education institutions should raise the issue of making political decisions on teachers' labor protection and improving their health. We believe that governments and communities should be informed about the necessary changes in the educational sphere, because it is time to protect the health of all participants in the educational process.

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