

Original Article in Occupational Health and COVID-19

Impact of the COVID-19 pandemic on essential workers in Europe: Subset analysis of a global online survey

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Abstract

Introduction: This study aims to explore how essential workers in Europe differed from the rest of the population in terms of their experiences of social life, access to services, mental well-being, and perceived benefits of the lockdown.

Methods: This study used a descriptive analysis to evaluate the overall experiences of the essential workers in Europe. Data analyzed in this study is part of a larger global online cross-sectional survey conducted during April to November 2020 involving post-secondary staff, students and the general population (remote workers). Data of 19,794 participants are included in the current study, and analysis is based on a comparison of participants who self-identified as essential workers, with those who did not using the chi-square test.

Results: Mean age was 34.5 years (SD =13.0) for essential workers and 30.2 years (SD =12.4) for the general population (remote workers). While 13.6% of all respondents were essential workers, the proportion was more among older ages (30 and above), females, and those who lived in suburbs. Overall, 46.8% of participants reported increased levels of stress during week 1-2 (51% of essential workers and 46.1% of the other participants, $p < 0.001$). More essential workers reported their social life being great than the rest of the population (25.3% vs. 16.4%, $p < 0.001$), and COVID-19 symptoms (13.6 vs 10.5%, $p < 0.001$). In addition, fewer reported having troubled relationships (16.3% vs. 18.6%,

$p < 0.001$) or being able to do sufficient exercise (35.7% vs. 40.5%, $p < 0.001$) than the general population (remote workers).

Take-home message: The important role of essential workers during the pandemic cannot be overstated, yet their contributions, especially non-healthcare essential workers, have not been fully appreciated.

Key words: COVID-19; Lockdown; Essential workers; Europe; Mental Health.

Cite this paper as: Eftekhar P, Othman N, Duncan A, Alotaibi S, Schuster AM, Nowrouzi-Kia B. Impact of COVID-19 pandemic on essential workers in Europe: Subset analysis of a global online survey. *J Health Soc Sci.* 2022;7(3):325-336. Doi: 10.19204/2022/MPCT7

Received: 15 July 2022; Accepted: 2 September 2022; Published: 15 September 2022

INTRODUCTION

According to the International Labour Organization, essential services are “those the interruption of which would endanger the life, personal safety or health of the whole or part of the population” [1]. The Centers for Disease Control and Prevention (CDC) defines essential workers as individuals “who conduct a range of operations and services in industries that are essential to ensure the continuity of critical function” of the country and include essential healthcare workers and non-healthcare workers whose work is essential to maintain and continue critical services and functions [2]. These include healthcare workers, emergency services, teachers, social and childcare workers, transit and delivery workers, food and grocery staff, and factory and farm workers [3,4]. The results of a large meta-analysis of evidence from seventy-one published studies ($n = 146,139$) indicated the prevalence of anxiety as 32.60% and depression of 27.60% in this population [5].

The unique situation and working circumstances during this period impacted essential workers in several ways. Evidence suggested that essential workers were at a higher risk of infection due to a range of factors specific to the type of industry. For example, essential workers worked in long production lines, with high volume of customers and contacts, in non-socially-distanced conditions, with lack of proper protective equipment and testing services, and were required to commute to work [6]. A study from Michigan stated that over half of the essential workers attending a clinic reported being affected negatively by the pandemic in terms of stress levels (66%), interactions with other people (65%), daily activities (59%), and enjoyment of life (56%), while they also reported positive impact in relation to caring for self and others and engagement in exercise [7,8]. Ramos and colleagues argued that workers in agriculture and food-related industries did not receive the same level of attention and protection as other essential workers, and continued to work in dangerous conditions; COVID-19 revealed the inequalities that existed for years [9].

The psychological impact of COVID-19 on essential workers is probably more widely studied, and includes experience of trauma, moral injury, sense of guilt, anxiety and depression, ‘feeling broken’, burnout, and fear of getting infected and infecting family members [6,10,11]. A study from Italy reported high psychological impact among frontline workers, especially healthcare (74%) and grocery workers (65%) [12]. However, it appears that different groups of essential workers are impacted differently. An Australian study found that essential healthcare workers reported less stress, anxiety and depression, and better quality of life than non-healthcare essential workers and the general population (remote workers) [13]. Job et al. (2020) also reported lower rates of depression among essential workers compared to the general population (remote workers) [14]. Factors that have reportedly been associated with depression and anxiety among essential workers during the pandemic include age and gender, professional and financial worries, factors related to exposure to the virus, pre-existing mental health issues, physical comorbidities, social support and physical abuse [14,15]. Research on the full impact of the pandemic on the life and well-being of the various groups

of essential workers is still limited especially impact on social life, daily activities, and access to services during the pandemic.

This current study examined further how essential workers in Europe differed from the rest of the population in terms of their experiences to social life, access to services, mental well-being, and perceived benefits of the lockdown. This study is a descriptive study about overall experiences of the essential workers as compared with the rest of the population.

METHODS

The data for this study was part of a large international online cross-sectional questionnaire (See Appendix – Questionnaire), which was mainly composed of close-ended questions. The target population for the survey included staff, faculty, and students of post-secondary institutions, as well as the general public (remote workers). People aged 17 and over were eligible to participate in the survey, as this minimum threshold was understood to be the entry age to a post-secondary institution. The survey was designed at the early stages of the pandemic by researchers at the London School of Economics and piloted with 20 students and members of staff nationally and internationally. It was translated into 16 languages and at least two native speakers validated each translation. The questionnaire was not pilot tested and specifically developed for this study. Ethics approval was obtained from the London School of Economics Research Ethics Review Board (REC ref. 1122) and the University of Toronto Research Ethics Board (REB# 39868). The survey questionnaire was developed on an online survey platform that was shared with partner universities and made available for staff, students, and remote workers. The study period, the lockdown was carried out across all the study participants. The self-administered online questionnaire included questions on age, gender, occupation, employment status, residence, geographic location, family income, physical activity, social life, self-reported mental health, and impact on education, business, and others.

The questionnaire was launched in April 2020 on the following website: <https://www.healthbit.com/the-lockeddown> allowing for online data collection on mobile devices and desktop computers. The survey interface was easy to complete with dropdown selections and tick boxes for various options. There were open ended questions for further input by participants. For wider coverage, the survey was made available in 16 languages and distributed by partner universities across the world. The first response was submitted on April 23rd and the last on November 21st, however, most responses were submitted during May, June and July. There were no exclusion criteria. The survey was sent to all students and staff at the universities. The sample questions were: My lockdown status; Since the start of the pandemic; I am/have been anxious I might get COVID and/or infect my family; I am/my family are experiencing financial difficulties due to the lockdown/pandemic.

The individuals were considered as the essential workers who worked during the lockdown at the workplace. This questionnaire was also used in other studies. [16,17].

Statistical analysis

For this paper's purpose, only participants were included who were living/studying in Europe during the survey. Classification on countries and continents is based on the listing by World Atlas (2020) [18]. Respondents who self-identified as an essential worker during the lockdown are compared with those who did not. Sampling was nonrandomized and no sample size was predetermined. The analysis was done in STATA version 13.0 [19]. The translated versions went through back-translation process with a native speaker to ensure their accuracy. Apart from age, all variables were categorical. Missing values of age were imputed with the median value of age separately for each category of students, staff and non-affiliated participants. Since the sample was large and the analysis was mainly descriptive, complete cases analysis were performed, excluding missing values. The change was self-reported increase or decrease in the stress, depression, and quality of life. The following variables were included in the analyses: 1) levels of stress and quality of life during the pandemic/lockdown 2) anxiety/depression. The chi-squared test and significance testing ($p < 0.05$) was used to analyze the data.

RESULTS

A total of 19,794 responses were collected from the global online survey from 41 European countries. Of these, 19,245 (97.2%) responded to a question about whether they worked as an essential worker during the lockdown/pandemic while the remaining 579 (2.8%) missed the question. Out of responders, 2,610 (13.6%) reported being an essential worker, while 16,635 (86.4%) were not. This analysis reports on these two groups and compares them to certain experiences. Table 1 summarizes the main characteristics of the two groups. The mean age was 34.5 years (SD 13.0) for essential workers and 30.2 years (SD 12.4) for the other group. While 13.6% of all respondents were essential workers, there were more essential workers (19.1%) among respondents from the remote workers (non-university affiliated), among those who participated in later months of the survey (17.5%), those aged ≥ 50 years (20%), females (14.0%) and people from suburb/countryside (15.6%). Levels of stress and quality of life during the pandemic/lockdown were measured as self-reported changes compared to the period before the lockdown (In lockdown/during pandemic, my level of stress (My quality of life): Stayed the same, increased, decreased). Anxiety/depression was also measured as a self-reported answer to a single statement (I feel/felt depressed/anxious: Yes/No). The essential workers and the rest of the sample are compared to categorical variables of interest using a chi-squared test. Level of significance is reported for all comparisons and $p \leq 0.05$ is considered significant.

Table 1. Main characteristics of the sample.

Characteristics		Not Essential worker	Essential worker
		Number (%)	Number (%)
All		16,635 (86.4)	2,610 (13.6)
Category	General public (remote workers)	1,191 (80.9)	281 (19.1)
	University staff	4,831 (83.7)	943 (16.3)
	University students	10,613 (88.4)	1,386 (11.6)
	Germany	7,392 (86.4)	1,168 (13.6)
	Czech Republic	2,539 (97.0%)	79 (3.0%)
	Austria	2,149 (85.6)	362 (14.4)
	United Kingdom	1,088 (89.1)	133 (10.9)
	Spain	976 (88.2)	130 (11.7)
	Bulgaria	719 (67.5)	347 (22.5)
	Others ¹	1,772 (81.9)	391(8.1)
Month of survey	April	326 (87.2)	48 (12.8)
	May	1,358 (83.9)	261 (16.1)
	June	5,075 (88.1)	688 (11.9)
	July	9,305 (86.2)	1,492 (13.8)
	Aug-Nov	571 (82.5)	121 (17.5)
Age group	Under 30	10,996 (89.7)	1,267 (10.3)
	30- 49	3,817 (81.1)	888 (18.9)
	50 and over	1,822 (80.0)	455 (20.0)
Gender	Female	10,051 (86.0)	1,638 (14.0)
	Male	6,308 (87.2)	928 (12.8)
	Other	69 (89.6)	8 (10.4)
	Prefer not to say	206 (85.1)	36 (14.9)
Residence	Large city	9,925 (86.7)	1,519 (13.3)
	Small city / town	4,301 (86.9)	647 (13.1)
	Suburb/ Countryside	2,409 (84.4)	444 (15.6)

Family income level	High Income	2,394 (88.1)	323 (11.9)
	Low income	1,767 (86.1)	286 (13.9)
	Middle Income	11,264 (86.5)	1761 (13.5)
	Prefer not to say	1,210 (83.4)	240 (16.6)
Age in years, Mean (SD)		30.2 (12.4)	34.5 (13.0)

¹Other countries where number of participants was below 1,000.

Social life during the lockdown/pandemic

Overall, almost 80% reported that the pandemic/lockdown impacted their social life, with 22.2% reporting that their relationships suffered or fell apart, and 18.3% reporting troubled relationships with people they lived with. Comparison of the essential workers with the other group in relation to social life and related activities is presented in Table 2. The types of jobs reported were under the following categories: Construction, Food/Catering, and front-line healthcare sectors. There were statistically significant differences between the two groups. Notably, essential workers were more likely to report their social life being great (25.3% vs. 16.4%, $p < 0.001$), and to have been responsible for child care (22.7% vs. 15.9%, $p < 0.001$), fewer reported having troubled relationships (16.3% vs. 18.6%, $p < 0.001$), similar numbers reported being subject to domestic violence and psychological abuses (2.3% vs. 2%), and fewer reported being able to do sufficient exercise (35.7% vs. 40.5%, $p < 0.001$). See Table 3 for more details.

Table 2. Social life and related activities during the lockdown/pandemic: comparing the two groups.

Experiences/ Activities		All	Not Essential worker	Essential worker	X ² , p
		Number (%)	Number (%)	Number (%)	
Social life	Has been great and I managed to stay positive	3,751 (20.2)	3,113 (16.4)	638 (25.3)	48.5, <0.001
	Was impacted but overall I am/was able to cope	9,500 (51.0)	8,309 (51.6)	1,191 (47.2)	
	Was negatively impacted	5,361 (28.8)	4,669 (29.0)	692 (27.5)	
Relationships	Improved	2,562 (20.9)	2,244 (21.5)	318 (17.5)	19.1, <0.001
	Suffered/ fell apart	2,728 (22.2)	2,339 (22.4)	389 (21.4)	
	Was not affected	6,975 (56.9)	5,865 (56.1)	1,110 (61.1)	
Troubled relationships with people I live with	No	13,351 (81.7)	11,541 (81.4)	1,810 (83.7)	6.7, <0.001
	Yes	2,987 (18.3)	2,635 (18.6)	352 (16.3)	
Experienced domestic/ psychological abuse	No	16,011 (98.0)	13,899 (98.0)	2,112 (97.7)	1.3, 0.26
	Yes	326 (2.0)	276 (2.0)	50 (2.3)	
I was responsible for child care	No	13,588 (83.2)	11,916 (84.1)	1,672 (77.3)	60.5, <0.001
	Yes	2,750 (16.8)	2,260 (15.9)	490 (22.7)	
Exercise	Don't exercise, no change for me	3,698 (19.9)	3,609 (19.2)	602 (23.9)	36.2, <0.001
	Do sufficient/more exercise	7,415 (39.8)	6,515 (40.5)	900 (35.7)	

Can't exercise as before 7,499 (40.3) 6,480 (40.3) 1,019 (40.4)

Access to services

Overall, 6,899 participants (37.1%) reported facing problems accessing products and services—whether physically or online—with no statistically significant difference between the essential workers and the other group (37.7% vs 37.0%). Of those who reported access problems, 59% reported problems accessing personal and professional services, 45.6% food and essential goods, and 26.1% reported problems accessing medicines and health services. Generally, there were no statistically significant differences in this regard between essential workers and those who were not essential workers (Table 3).

Table 3. Problems accessing services: comparing the two groups.

	All	Not Essential worker	Essential worker	X ² , p
Have problem accessing...	Number (%)	Number (%)	Number (%)	
Products and services physically or online	6,899 (37.1)	5,949 (37.0)	950 (37.7)	0.48, 0.49
Personal/professional/domestic services	4,082 (59.2)	3,496 (58.8)	586 (61.7)	2.9, 0.09
Food and necessary goods	3,146 (45.6)	2,716 (45.7)	430 (45.3)	0.06, 0.8
Medicines and health services	1,798 (26.1)	1,516 (25.5)	282 (29.7)	7.5, 0.006
Other services	979 (14.2)	837 (14.1)	142 (15.0)	0.52, 0.47

Health experiences

Table 4 summarizes health-related experiences of participants. Overall, 19.2% of respondents reported having an underlying health condition with a significantly higher proportion among essential workers (24.7% vs. 18.3%, p<0.001). Similarly, 28.9% reported having non-COVID-19 related health issues more so in essential workers (31.8% vs 28.4%, p<0.001). Significantly more essential workers reported losing someone close as a result of COVID-19 (3% vs. 1.9%, p=0.001) and to another health-related condition (4.3% vs. 3.1%, p=0.002). In relation to COVID-19 infection, 13.6% of essential workers reported having COVID-19 symptoms versus 10.5% from the other group (p<0.001), and more essential workers were tested for COVID-19 than the other group (31.7% vs. 20.8%, p<0.001); however, the positivity rate was not statistically significant between the two groups.

Table 4. Health experiences during the lockdown/ pandemic: comparing the two groups.

	All	Not Essential worker	Essential worker	X ² , p
	Number (%)	Number (%)	Number (%)	
Has underlying health condition	3,685 (19.2)	3,040 (18.3)	645 (24.7)	60.6, <0.001
Had non-COVID related health issues	5,331 (28.9)	4,534 (28.4)	797 (31.8)	12.4, <0.001
Lost someone close to COVID-19	384 (2.1)	310 (1.9)	74 (3.0)	10.9, 0.001
Lost someone close to another health condition	597 (3.2)	490 (3.1)	107 (4.3)	10.0, 0.002
Was not able to effectively access health services ¹	3,006 (27.6)	2,590 (27.8)	416 (26.5)	1.2, 0.28

Was able to effectively access health services	7,879 (72.4)	6,724 (72.2)	1,155 (73.5)	
¹ Someone in my family had a health emergency but not adequately dealt with	1,785 (9.7)	1,526 (9.6)	259 (10.3)	1.5, 0.22
I had COVID-19 symptoms	2,018 (10.9)	1,677 (10.5)	341 (13.6)	21.5, <0.001
I was tested	456 (22.6)	348 (20.8)	108 (31.7)	16.5, <0.001
My test result was positive	64 (14.4)	50 (13.0)	12 (13.0)	0.88, 0.64

¹ Among those who needed services; question was not applicable for 7597 (41.1%)

Impact on mental well-being

Participants were asked about their stress level, quality of life, and experiences of anxiety/depression during the lockdown. As shown in Figure 1 (1.1), a significant proportion reported increased levels of stress especially during the first two weeks of the lockdown. Overall, 46.8% of participants reported increased levels of stress during week 1-2 (51% of essential workers and 46.1% of the other participants), a statistically significant association ($p < 0.001$). The stress level and the difference between the two groups decreased in later weeks with similar percentages reporting increased stress (34.1% vs. 34%) at and after week five.

As for reported changes in quality of life, as shown in figure 1 (1.2), the trend was similar where larger proportions reported decreased quality of life in week 1-2 (overall 44.1%) than week five and later (34.6%). Slightly fewer (less than 1%) essential workers reported a decrease in quality of life than the rest of the participants, e.g., 43.4 % vs. 44.2% in week 1-2 but due to the large sample size was statistically significant ($p = 0.04$).

Additionally, 39.7% of participants reported feeling anxious/depressed during the first two weeks of the lockdown, with no significant difference between essential workers and other participants (39.0% vs. 39.8%). However, significantly fewer essential workers than others reported being anxious/depressed in weeks 3-4 (37.6% vs. 40.3, $p = 0.001$) and in weeks 5 and later (33.2% vs. 37.8%, $p > 0.001$).

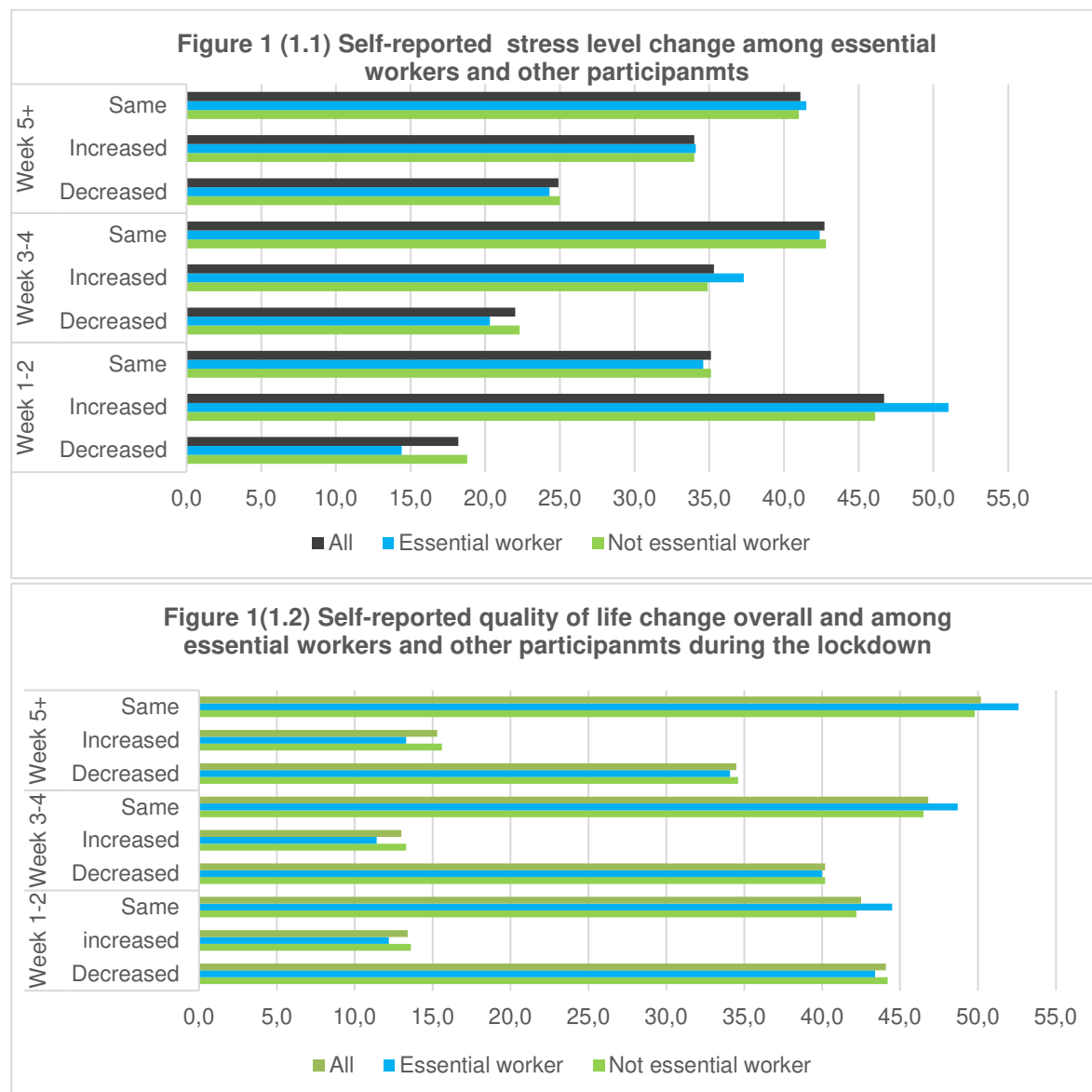


Figure 1 (1.1/1.2). Self-reported stress level changes and quality of life changes among essential workers and other participants.

Benefits of the lockdown

Overall, 5860 (31.5%) respondents reported that the lockdown was beneficial to them, with significantly fewer essential workers (29.2%) compared to 31.9% of the other group (p=0.02). The reported benefits included more time for family and hobbies (69%). Interestingly, only 61.6% of essential workers reported this benefit compared to 70.1% of the other group (p<0.001). Fewer essential workers reported more time for self-education than the general population ((37.7%) vs 44.8%, p<0.001); however, essential workers were more likely to report starting new projects or initiatives in comparison with the general population (27.2% vs. 19.7%, p<0.001).

DISCUSSION

This study compared the impact of the lockdown/pandemic on people who self-identified as essential workers with those who did not do in an online survey, related to social life, health experiences, and changes in stress levels and quality of life. We found significant differences between both groups where essential workers were more positive about social life and relationships, but fewer of them reported being able to sufficiently exercise. Underlying health conditions, non-COVID-19

related health issues, having COVID-19 symptoms, and loss of loved ones to COVID-19 were also more common among essential workers than the other group. A higher percentage of the participants reported increased stress levels and decreased quality of life in the initial weeks of the lockdown than later, and more essential workers reported increased stress levels in the first two weeks of the lockdown than the other group. While over one-third of all participants reported having problem accessing products and services, there were no significant differences between the two groups.

The increased levels of stress and anxiety and the reduced quality of life during the lockdown is consistent with other studies [12,15,20–22]. While this applies to the general population as well, uncertainty about the situation, the imminent risk of infection and their unique circumstances of being somehow forced to be at work while other workplaces were closed, might explain why more essential workers reported increased levels of stress during the first two weeks of the lockdown than the rest of the population. In later weeks, the increased stress level was similar between the two groups, which suggests that essential workers adapted or accepted to live with the new situation. As for anxiety and quality of life, our results are consistent with studies that reported less anxiety and better quality of life among essential workers than the general population [13,14,23].

Working and being productive in those difficult circumstances might have given more meaning to the lives of essential workers than those who were unable to perform their usual work and activities. This is what Bennett et al. found in the quotes of health care workers in the United Kingdom (UK) being proud of themselves and describing their dedication to patients as a “personal responsibility” and being “hugely important... at these times more than ever” [10]. It is also notable that overall, fewer participants reported reduction in quality of life in later weeks (34.6%) of the lockdown than the initial two weeks (44.1%), which might be an indication of peoples’ resilience and their ability to find other ways to engage and enjoy their lives.

It might not be appropriate to compare rates of COVID-19 infection among essential workers across studies since this is dependent on the context and timing of each study during the pandemic, but our results indicating higher rates of COVID-19 symptoms among essential workers and more COVID-19 related deaths of their loved ones compared to the general population are expected and consistent with other studies. In their review, Gaitens et al. (2020) have reported multiple examples of COVID-19 infections and deaths among various groups of healthcare and non-healthcare essential workers (food processing, grocery, transit, correctional facilities, emergency responders) in Europe and the United States of America (USA). A cohort study from USA and UK also reports higher rates (adjusted hazard ratio of 3-40) of COVID-19 infection among frontline health workers than the general population [24]. Essential workers are at a higher risk of the infection due to more likelihood of exposure to the virus because of the nature of their work and more contacts with people, and therefore they require more attention for protection such as ensuring occupational safety measures, testing and health assessments, training, information sharing, and appropriate sick leave policies [6]. Another study in USA indicated that essential workers from minorities and lower socio-economic status have a lower access to healthcare but a higher probability of infection [25].

The extended periods of social distancing and lockdown meant that people would have less opportunities for face-to-face meeting and ‘normal’ social interactions that are well known to positively impact mental well-being. Our results on the negative impact of the pandemic on social activities and relationships are consistent with other studies [7,26,27]. These social activities and relationships in turn are associated with mental well-being. Sommerlad et al. (2021) from UK found that more face-to-face or daily phone or video contact was associated with lower depressive symptoms [28]. Other researchers have shown an increased sense of emotional support, instrumental support, and loneliness, and decreased feelings of friendship during the pandemic [29]. The interesting finding in our study is the less negative impact on essential workers fewer of whom reported a negative impact on social life and relationships. This may be because essential workers continued to go to work, interact with people, and enjoy the feeling of achievement and productivity more than most of us who were largely spending our time at home. However, this requires more

research, especially qualitative, to explore the insights, feelings and experiences of the essential workers on their role in keeping the society functioning during the pandemic.

Access to products and services problems was common in over one third (37%) of all participants with no difference among essential workers and others. Interestingly, over 45% of these had problems accessing food and essential services which was close to 17% of the whole sample. Additionally, over 27% of all participants reported not being able to access health services effectively. These access problems seem to have been a major issue for a significant proportion of people, including essential workers, as reported by other studies [9,30]. As for the reported benefits of the lockdown, fewer essential workers reported benefits except for starting new projects and initiatives which might be to the fact that they were working in a challenging and changing situation and had more exposure to new problems, ideas, and opportunities.

Although the study was a cross-sectional survey, data collection continued for several months and thus the experiences reflect extended periods of the pandemic especially the first few months. The survey was self-administered, and all measures were based on self-reporting which could be a limitation and should be kept in mind while interpreting the findings. We did not have categories of essential workers, which would have been good for comparison as experiences could be different. However, the purpose of the study, which was initiated early in the pandemic, was not a specific narrow research question but an overall description of the experiences of people during the pandemic and for that purpose, we believe the large sample provides rich information and insights.

Study limitations

This study is a secondary analysis of a data set and focused on the descriptive analysis. Also, this study only examined European countries. The definition of an essential worker as used by the researchers was not communicated clearly with the respondents. Since the major outcome measures/variables of interest were only assessed using single Yes/No questions; This highlights potential validity and reliability issues, such as face and content validity, with the respondents' responses. This survey was collected from different types of educational institutions which the work condition was not equal during the pandemic. The possibility of multiple responses by participants was not controlled or addressed. Another limitation is that the questionnaire used was no validated nor pilot tested. Finally, given the exploratory nature of the study, we did not conduct a power analysis for the sample size calculation.

CONCLUSION

Essential workers played a crucial role during the pandemic/lockdown to keep the society functioning. They experienced the impact of the pandemic more strongly and differently than the rest of the population in terms of rates of infection, health and psychosocial aspects. Their roles and contributions—especially those of non-healthcare essential workers—have not been fully appreciated and researched. Further quantitative and qualitative research to their experiences is required to gain insight of their specific needs and problems. Future studies are recommended to deepen our understanding of the physical and mental impact of the circumstance on the essential workers to assist with the policy makers and services providers.

Author Contributions: NO conceived the idea of the article, undertook the analysis and led initial preparation of the manuscript. PE took the lead as first author. BNK and AD provided consultation on data analysis and reviewed and edited the manuscript. BNK and AD reviewed and approved the final version of the paper. SA and AS reviewed and edited the manuscript and approved the final version of the paper.

Funding: Department of Occupational Science and Occupational Therapy, Temerty Faculty of Medicine, the Office of the Vice-Principal Research & Innovation, and the International Office at the University of Toronto.

Institutional Review Board Statement: The study was conducted in accordance with the University of Toronto Research Ethics Board, the London School of Economics Research Ethics Board and the Pusan National University Institutional Review Board.

Informed Consent Statement: All participants provided informed written consent.

Acknowledgments: We acknowledge the role of Dr. Leeza Osipenko from London School of Economics who led the LockedDown survey. We also acknowledge IT support to Ifty Ahmed and Healthbit and to Anouska Nithyanandan from LSE who co-ordinated all data-sharing agreements. We also acknowledge Dr. Bernardo

Perez and Kseniia Prudyus for their active role on the project during 2020. We would like to thank all the volunteers who supported this project with translation and the individual University partners. All partners and volunteers are listed here: <https://www.healthbit.com/the-lockeddown/>.

Conflicts of Interest: The authors declare no conflict of interest. The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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