






## Impact of COVID19 on resident physicians of a community hospital in New York city

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### ABSTRACT

**Introduction:** Novel Corona Virus Disease 19 has created unforeseen burden on health care. New York city is one of the epicenters of pandemic and here we explore physical, mental and social impact of COVID 19 on Resident Physicians (RP) working within the center of this epicenter.

**Methods:** This is a single-center cross-sectional web-based survey involving RP of a community hospital in Brooklyn, New York. Questionnaire was formulated in online platform. We used a convenient sampling method. Univariate analysis was conducted and presented the distribution of qualitative responses as frequency and percentages.

**Result:** COVID19 related symptoms were reported by 39.8% RP. COVID19 IgG and IgM antibodies, both negative were reported by 34.9%, while only 6% RPs were IgG antibody positive. Symptomatic RP tested for COVID19-PCR was positive in 42.42%. Self-isolation from family during the pandemic was reported by only 14.5%. Financial constraints, lack of accommodation, and emotional reasons were main reasons of not being able to self isolate. Being bothered by 'Anxiety' and 'Nervousness' were reported by 8.5% on 'Almost every day' while 46.3% reported on 'several days in the two weeks duration'. 'Uncontrollable worrying', 'Feeling down', 'Depressed', or 'Hopeless' was reported as 'Not at all' by 78.8% and 3.7% reported it to 'occur nearly every day for the last two weeks'.

**Conclusion:** Aftermath of fight against pandemic has left RP with significant physical, mental, and social impact. Appropriate stress management and safety interventions are urgently needed. Further studies are needed to explore the detailed impact of COVID19 on RP.

### ARTICLE HISTORY

Received 7 July 2020  
Accepted 6 October 2020

### KEYWORDS

COVID 19; Resident physician; New York city

## 1. Introduction

Coronavirus disease –19 (COVID-19) is a multi-system disease that can involve the respiratory tract and may result in Severe Acute Respiratory Syndrome novel Coronavirus –2 (SARS-CoV-2). First reported in Wuhan, China, and later emerged as a pandemic with over 80,85,932 and 210,591 confirmed COVID-19 cases globally and in New York City (NYC), respectively as of 16 June 2020 [1]. New York State, one of the largest epicenter of the pandemic, reported over 52,000 hospitalizations with more than 21,000 deaths related to COVID-19 as of 6 June 2020 [2]. This condition has posed unprecedented pressure on health care especially in resource-limited facilities. Frontline health-care workers (HCW), primarily resident physicians (RP), are an integral part of the healthcare system in the USA and have played a significant role in this colossal crisis in NYC. However, minimal literature exists regarding the physical, socioeconomic and mental impact of COVID19 on RP [3]. Here, we explored the physical, emotional and social implications of COVID 19 on RP of a small community hospital located in central Brooklyn.

## 2. Methods

Our study is a single-center cross-sectional web-based survey involving RP training in a community hospital in central Brooklyn, New York. We requested a total of 150 RPs training to voluntarily complete a web-based questionnaire formulated in the survey administration online platform- Google Forms, Google LLC. We included RPs from different specialties, including Internal medicine, psychiatry, podiatry, ophthalmology, and dentistry. Out of 150 RPs, 83 completed the survey containing 33 questions. The survey questionnaire included demographic segment, which included questions regarding age, sex, marital status, postgraduate year of training, department, and residence status. The second segment of the survey included questions regarding CoVID-19, which included items like symptoms, CoVID19 test (PCR and immunoglobulins), results, and ease of access to the tests. The final segment of the survey included questions relating to the assessment of satisfaction with the level of support from leadership, mental health of the RPs, and their significant concerns while working in the CoVID-19 crisis. We used a convenient

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sampling method for data collection and presented the distribution of qualitative responses as frequency and percentages. Univariate analysis was conducted, and qualitative variables were described by rate and percentage. Informed consent was obtained at the beginning of the questionnaire.

### 3. Results

RP participating in the survey were mostly from the Department of Internal Medicine department (83%), Psychiatry (12%), and Podiatry (4.8%). Postgraduate year (PGY) 3 were the majority of the responders (43.4%), followed by PGY 2 (34.9%) and only 18.1% participation from PGY1. The average age of the responding RPs was 34.6 years, with 62.7% being male, 84.3% were married, and 57.8% had children (Table 1). Seventy-seven percent lived with family members, while 14.5% reported living alone. Out of 83 responses, 33(39.8%) said they had COVID19 related symptoms, while 21(25.3%) were unsure of it, while 29(34.9%) had no symptoms. All the RPs who believed they had COVID-related symptoms had COVID 19 PCR test. Only 48 responses were received about the COVID19 PCR test results, and 14

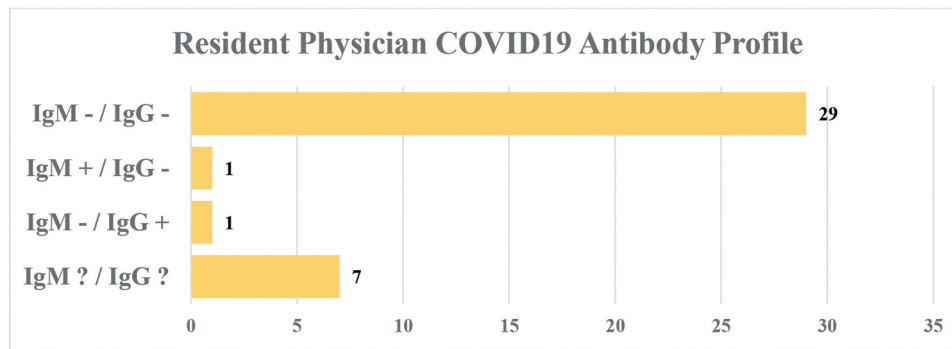
**Table 1.** Description of resident physicians ( $n = 83$ ).

| Department                          | n  | %    |
|-------------------------------------|----|------|
| Internal medicine                   | 69 | 83.1 |
| Psychiatry                          | 10 | 12   |
| Podiatry                            | 4  | 4.8  |
| Post Graduate Level of training     |    |      |
| PGY1                                | 15 | 18.1 |
| PGY2                                | 29 | 34.9 |
| PGY3                                | 36 | 43.4 |
| PGY4                                | 1  | 1.2  |
| PGY5                                | 2  | 2.4  |
| Age (Years)                         |    |      |
| <40                                 | 72 | 86.7 |
| >40                                 | 11 | 13.2 |
| Gender                              |    |      |
| Male                                | 52 | 62.7 |
| Female                              | 31 | 37.3 |
| Marital status                      |    |      |
| Married                             | 70 | 84.3 |
| Single                              | 13 | 15.7 |
| Lives with Alone/family or Others   |    |      |
| Alone                               | 12 | 14.5 |
| Family                              | 64 | 77.1 |
| Others                              | 7  | 8.4  |
| Children                            |    |      |
| Yes                                 | 48 | 57.8 |
| No                                  | 35 | 42.2 |
| Considered staying away from family |    |      |
| Yes                                 | 42 | 50.6 |
| No                                  | 19 | 22.9 |
| May be                              | 10 | 12   |
| NA                                  | 12 | 14.5 |
| COVID related symptoms?             |    |      |
| Yes                                 | 33 | 39.8 |
| No                                  | 29 | 34.9 |
| May be                              | 21 | 25.3 |
| Results of COVID 19 PCR             |    |      |
| Positive                            | 14 | 16.8 |
| Negative                            | 34 | 40.9 |
| NA                                  | 35 | 42.1 |
| Antibody test                       |    |      |

(29.2%) RPs reported to have been tested COVID19 PCR positive while 34 said it to be negative. Free of cost COVID19 Antibody testing available at the institution was performed by only 38(45.8%), while 45 (54.2%) did not opt for it. Among those tested for antibody, only one RP had IgM positive and IgG negative. COVID19 IgG and IgM both negative were reported by 29(34.9%) RPs, while only 5(6%) RPs were IgG Positive (Figure 1). Only 36% of the RPs called out sick, and on average, they took 3.08 days off during the crisis. Most RPs took only 1 day off, while 22.9% used more than 7 days. Confidence in the use of Personal Protective Equipment (PPE) was also evaluated in our survey. On a scale of 1 to 10, '1' being 'Not confident' and '10' being 'Extremely Confident.' Greater than 73% of RPs reported having a confidence level of 8 or higher, while none of them reported  $\leq 3$  levels of confidence. Amidst, the national shortage of PPE, >80% RPs said hospital performance as  $\geq 6$  on the scale of 1 to 10, where '10' represents 'Excellent Performance' and '1' represents 'Very Poor Performance.' RPs were asked if they were exposed to confirmed or suspected COVID19 cases without the right set of PPE. Fifty-four percent reported 'Yes', and 26.5% said 'Maybe,' while only 19.3% reported 'No'. Impact on personal life was evaluated on the scale of 1 to 5, 1 being 'least worried' and 5 being 'most worried' about the effects on private life, 66.2% of the patients reported >4 on being impacted on personal experience by the pandemic. 'Anxiety' and 'Nervousness' were reported as 'Not bothered at all' by 34.1%. In comparison, 8.5% said 'Being bothered Almost every day', and the majority 46.3% reported 'Being bothered on several days in the two weeks'. Although this survey was conducted after a decline of COVID 19 pandemic peak in NYC, 5 RPs (6.1%) reported 'being bothered every day by inability control worrying', and 57.3% said 'Not being bothered at all'. 'Feeling down', 'Depressed,' or 'Hopeless' was reported as 'Not at all' by 78.8%, while 3.7% [3] RPs did report it to 'occur nearly every day for the last two weeks'.

### 4. Discussion

Central Brooklyn community comprises of mainly African Americans (64%) and Latinos (20%), with 11% of the population above 65 years of age. Comorbidities are widely prevalent in obesity (29%), diabetes (13%), and hypertension (34%), which is estimated to be one of the highest among NYC communities and designated as medically underserved population (index of medically underserved score 44.5) by health resources and administration [4]. NYC became the epicenter of the COVID-19 pandemic, with over 203,000 confirmed cases and over 21,000 deaths. HCW in NYC faced unique challenges not only because of uncertainties related to its management of the novel disease but also due to the unfathomable spread seen unlike anywhere else



**Figure 1.** Antibody profile of resident physicians demonstrating IgG and IgM positivity and negative.

rampaging populations with lower socioeconomic status with prevailing comorbid conditions. Resource limited small community hospitals were overwhelmed which directly affected RPs who are among the crucial forefront workhorse of the health-care institutions in NYC [3,5]. These challenges put the physical and mental health of RP at significant risk. One study analyzed 1257 HCWs from 34 hospitals in China and reported 50.5% depression and 44.6% anxiety rate, which is unacceptably high [6]. Another study from Germany reported 2.2%-14.5% severe depression and anxiety symptoms, which are similar to our observation of concerning symptoms (3.7%-8.5%) [7]. Burnout among the physicians in training and practicing physicians are reported up to 50% before the COVID19 pandemic. Still, now this number is estimated to rise, especially with immense personal, social, and professional stressors [8,9]. Most of the RPs reported being married (84.3%), had children (57.8%), and were currently residing in the same house with family (70%). They said constant fear of being infected and also fear of infecting loved ones. Although about 50.6% RP considered to self-isolate from family to protect them during the pandemic but only about 14.5% reported were being able to do so. Financial constraints, lack of accommodation, and emotional reasons were among the chief reasons among the 77.1% RPs not being able to self-isolate despite seriously considering it. With the national average annual income of RP of about 61,200, USD it becomes next to impossible to sustain a family and renting two apartments in NYC financially [10]. In the one hand, supporting RPs and other essential workers with compensation to self-isolate can be a possible way of helping RPs to feel safe. On the other hand, living alone might have a grave impact on their mental and emotional wellbeing. Coping with the extreme stress at work and self-isolation will negatively impacts on emotional and spiritual wellbeing of HCWs. Balancing HCWs family's safety, personal safety, and mental wellbeing is a complex issue with enormous consequences not only to the HCWs own life but also on their patient

outcomes. Setting up services like 24–7 Emotional support hotline, resting area, hydration/food stations, a scheduled day off, mindfulness exercise sessions, increasing supporting staff in hospitals and ease of access to psychological support programs are some of the areas to focus to ensure the wellbeing of RPs. Few institutions have been financially helping RP with 'Hazard Pay,' which is not a perfect solution but might be of some help to RP with financial constraints.

RP working in NYC are at higher risk for COVID19 infection, and no data exist on the prevalence of COVID19 on RP. One study reported that 7.3% of HCW tested positive for CoVID-19. In contrast, 0.4% of non-HCW tested positive with 7% greater absolute risk for HCW (95% CI 4.7–9.3%) but in our observation, out of 38 RPs who got tested 5 RPs reported to be IgG positive (13%) which is higher than the 7.3% reported by the study [11]. This difference is mostly due to the geographic location, the dynamics and prevalence of the disease at the time of the study, and the risk of exposure and type of tests used. Out total 33 RPs who had self-reported COVID19 symptoms and got tested for COVID19-PCR 14(42.42%) reported being positive while 7(21.21%) chose not to reveal PCR status and 12(36.36%) of them were COVID19 PCR Negative. Thirteen of the symptomatic RPs with negative or unknown PCR had IgM and IgG negative. In contrast, 5 (15.1%) out of 33 symptomatic reported being IgG positive among them 3 had PCR positive, and 1 had PCR negative. Fourteen symptomatic RPs did not reveal or did not get tested for antibodies. Fifty RPs were unsure or did not have any self-reported COVID19-related symptoms, and among them, 22(44%) of them reported negative test while the rest of the remaining 28 RPs chose not to respond. Interestingly, none of the RPs without symptoms said they had PCR Positive but only one RP who was unsure of the results and had PCR negative but was tested IgM positive and IgG Negative. Antibodies assay gives presumptive idea on the scale of exposure to CoVID-19; surveillance

of people with antibody tests against the virus has potential implications in shaping the new pandemic guideline [12]. However, details of immunity and risk of transmission conferred by the antibody against CoVID19 is currently being investigated and is beyond the scope of this paper.

Amongst the RPs, getting infected with the virus and infecting family members was the topmost concern, nearly 40% of RP expressing this concern. Given the nature of the contagion of COVID-19, the surge in cases, lack of PPE, restructuring of the health care facility, risk of being infected and infecting others put RPs on the intense emotional strain [13]. Some of the other concerns expressed were limited supplies of personal protective equipment, the second wave of the pandemic, fear of burn out, financial constraints, and declining job opportunities for the graduating RPs and its impact on their immigration visa status. Other challenges faced by RPs during the pandemic include an unusually high number of untimely deaths and ethical issues relating to critical decision-making in a resource-limited system under crisis [13]. All these risk factors put RPs under greater psychological vulnerability and burnout which is reflected in the data here which shows 46.3% of the RPs felt that they were bothered by nervous or anxious on most of the days consistent with the surveys done during previous pandemics like SARS-CoV1, influenza A, H1N1 [13]. In a study done post-pandemic (SARS) showed long-term psychological morbidity outcomes in HCW such as burnout, psychological distress, posttraumatic stress, decrease in interpersonal interaction, decrease in work hours post-pandemic, increase in smoking and alcoholism [14]. Measures need to be in place and implemented by programs and hospitals to mitigate emotional and physical toll on RPs even long after the pandemic is over. Constant support at various levels to ensure RP and their family safety must be addressed urgently. Single center, cross-sectional observational study design and limited number of respondents are major limitations of the study. The data represented here cannot be generalized and lacks longitudinal follow up. Recall bias cannot be eliminated since it is a web-based questionnaire. Also, lack of baseline data to compare the responses.

## 5. Conclusions

RP plays an indispensable role in fight against COVID-19 and its aftermath has left RP with significant physical, mental and social impact. Appropriate stress management and safety interventions need to be urgently addressed for better preparedness for possible future waves of COVID19 pandemic or other disasters. Further studies are needed to explore the impact of COIV19 on RP physical and mental wellbeing.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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