

## ORIGINAL ARTICLES

## THE IMPACT OF CORONA VIRUS DISEASE-19 (COVID-19) ON POSTGRADUATE PAEDIATRIC RESIDENTS

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## ABSTRACT

**Objective:** To explore the impact of corona virus disease-19 pandemic on postgraduate paediatric residents.

**Study Design:** Mixed method study.

**Place and Duration of Study:** Pak Emirates Military Hospital Rawalpindi, from Apr to May 2020.

**Methodology:** Post graduate paediatric residents working in Pak Emirates Military Hospital and Combined Military Hospital Rawalpindi, Pakistan were included by purposive sampling technique. Sample size was predetermined, included all (forty total) residents of two hospitals. Participant's written response was obtained on an open ended self administered-questionnaire distributed in person. All enrolled participants responded. Thematic analysis of data was done.

**Results:** The participants were predominantly female (n: 30, 75%) of age range 31-35 (50%) years. The first theme category was "Impact on personal life" The residents reported an unprecedented physical, psychological and social stress. The second category was "Family life during COVID-19" Residents had to share extra family/ financial/health responsibilities of their families. "Professional duties and training" was another theme category. Residents worked in new context of environment, fear of contagion, managing interpersonal / interprofessional relationships, less volume of patients/clinical experience / skills and new e-learning modalities. "Challenges and suggestions to cope" is another category, where residents suggested strategies and sources to improve patient care, their well being and training during pandemic.

**Conclusion:** The residents had experienced intensive physically, emotional and social stress. Most of them behaved with resilience and extreme professional dedication. Different competencies of training are being affected. Concerned authorities must adopt new strategies to support resident's training and personal life.

**Keywords:** COVID-19, Impact, Pakistan, Pandemics, Residents.

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## INTRODUCTION

The first confirmed case of Corona Virus Disease (COVID-19) was reported in Pakistan on 26th February, 2020. By end of March 2020, outpatient department services were reduced to emergencies in Armed forces hospitals. In first week of April one of the twin Army hospitals at Rawalpindi meant for paediatric medicine residency was designated for only COVID-19 positive cases and readjustments were made in both hospitals to cater for routine out/indoor paediatric patients. "Physical distancing, hand washing and mask wearing" became common

slogan among health care professionals. Large gatherings, including clinical sessions and educational conferences, were abruptly ceased. Paediatric residents were pulled off from clinical sessions and interventions to protect them from COVID-19 exposure. With surge of COVID-19 cases, healthcare delivery into telehealth and telephone-based models changed paediatric clinical landscape drastically. The potential redeployment of consultants as well as residents in areas of need was also planned.

The Government of Pakistan issued directives for closure of outpatient department (OPDs) and elective surgical services to enhance and sustain emergency preparedness. In-presence academic activities in all medical universities/ colleges and academic institutions of Pakistan

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Received: 10 Jun 2020; revised received: 07 Jul 2020; accepted: 27 Jul 2020

were also terminated. Pakistan Higher Education Commission (HEC) issued guidelines related to online classes to minimize academic loss.

The COVID-19 pandemic has inimical impact on health care professionals including stress, anxiety, depression, emotional distress and burnout<sup>1</sup>. Common physical symptoms reported in literature during infectious pandemic/epidemic are pain, weakness, fatigue, lethargy, insomnia, weight gain and headache<sup>2</sup>. Consequences of social isolation are treacherous and include post-traumatic stress symptoms, physical inactivity, drug abuse, family violence/abuse and increased mortality. These effects are aggravated by prolonged isolation, financial/job loss, infection fear, frustration, boredom and inadequate social support<sup>3</sup>.

The delivery of patient care and medical education across all countries and specialities from Pulmonology to Neonatology have been disrupted by COVID-19<sup>4</sup>. Both extrinsic and intrinsic factors are responsible for this disruption. Competency based medical education, necessary for the training of next generation paediatricians, involves combination of clinical sessions, hands on clinical skills, emergency management and didactic conferences. In present pandemic situation, in-person didactics were cancelled, in/out patient's volume has significantly reduced and residents have lost the opportunity for personal development through conference presentations<sup>5</sup>.

We, the health care professionals, in recent past had not experienced such a large scale pandemic except the severe acute respiratory syndrome (SARS) epidemic in 2003. The effects of this epidemic on residents training has been shared by Sherbino and Atzema and Rambaldini *et al*<sup>6,7</sup>. During SARS epidemic elective cases were halted, some rotations cancelled, residents re deployed in necessary services and in-person conferences were eliminated. This modified educational experience continued for one-third of the academic year. Medical institutions in China during this SARS epidemic (2003) introduced and

implemented several new initiatives like online problem-based learning techniques to complete the curricula. This online teaching was an excellent experience and later on it was included in curriculum<sup>8</sup>.

Medical student - patient contact was suspended by The Association of American Medical Colleges (AAMC) during COVID-19 pandemic<sup>9</sup>. Faculty supervision of residents dealing with COVID-19 confirmed/suspected cases was recommended by The Accreditation Council for Graduate Medical Education (ACGME)<sup>10</sup>. Modifications purposed in residency programs include decreasing resident staffing to 50% of normal and making teams to rotate on weekly basis to restrict contagion exposure. Consultant-resident ward rounds include minimal necessary health care professionals in-person with physical distancing. Medical conferences in-person have transitioned to virtual conferences by using video conference technology to ameliorate exposure risk. We must adapt to this new dilemma as soon as possible so that there are nadirest effects on our residents training and patient care. Eventually as a medical community, we will gain both formative and transformative experiences from this pandemic.

The consternation due to COVID-19 in Pakistan is palpable. The healthcare system of our country confronts unprecedented challenges due to COVID-19 pandemic. Teachers and learners are panic and confused regarding medical education. At present there are no set guidelines issued by Pakistan Medical and Dental Council (PMDC) or College of Physicians and Surgeons of Pakistan (CPSP) to grapple with this pandemic aside from few guidelines issued by Pakistan ministry of health. The changes and limitations adopted by different hospitals and institutions during this pandemic for patient care and residency training are necessary but heterogeneous. So we decided to conduct this study to assess deleterious collateral effects of this pandemic on our residents and residency training and seek their suggestions to combat these challenges.

The objective of our study was to explore the impact of corona virus disease-19 (COVID-19) pandemic on postgraduate paediatric residents working at Pak Emirates Military Hospital and Combined Military Hospital Rawalpindi.

## METHODOLOGY

This was a mixed method study of paediatric residents providing neonatal and paediatric healthcare services. This survey was conducted from April-May 2020. Permission to conduct study and Ethical approval was obtained from Ethical Review Committee of PEMH Rawalpindi vide letter no A/28/

### Participants

The target participants for this survey were paediatric residents directly providing neonatal and paediatric health care services in different wards of both hospitals. Study sample was recruited by purposive sampling technique. Sample size was 40 in number (year 1 to year 4 residents) undergoing paediatric residency training. The study objectives, voluntary participation and confidentiality were explained to participants. Written consent for participation was obtained. All residents consented, participated in study. Confidentiality was assured by using numbers instead of names while collecting data. The sampling was non-random but purposive and not intended to generate generalisable nationally representative results of either residents or health facilities. Our aim was to collect and synthesise effects of COVID-19 on doctors undergoing residency training in paediatrics and directly involved in the care of COVID-19 negative/positive children. Some of the residents were temporarily involved in care of COVID-19 positive adult patients. Variation in years of residency and hospital employment were sources of diversity.

### Questionnaire

An open-ended self administered questionnaire was developed by researcher in consultation with public health, infectious diseases and infection prevention/control experts<sup>11</sup>. The questionnaire was prepared in English and was piloted (n=8) by asking to complete the question-

naire and give feedback. We used this feedback to assess face validity, technical compatibility and refine the wording of the questions. We collected data on the respondents' background (age, gender, marital status, living alone/with family and type of care provided). Participants were asked to answer questions regarding impact of COVID-19 on their personal life, family life, professional life, professional training, interprofessional relations and financial impact if any. Their suggestions to cope with this pandemic were also sought. It was mandatory to answer all items of questionnaire.

### Data Collection

Paper-and-pencil self administered questionnaire was distributed in person in both hospitals.

**Table-I: Characteristics of participants (n=40).**

Parameter	Variable	n (%)
Gender	Male	10 (25%)
	Female	30 (75%)
Age	20-25 years	4 (10%)
	26-30 years	16 (40%)
	31-35 years	20 (50%)
Marital status	Married	30 (75%)
	Unmarried	10 (25%)
Living with parents	Yes	32 (80%)
	No	08 (20%)
Type of residency	Permanent	40 (100%)
	Temporary	-
Type of care provided	Indoor care	40 (100%)
	Outdoor care	40 (100%)
	COVID Positive care	30 (75%)
	Neonatal care	36 (90%)
	Paediatric care	36 (90%)

All enrolled participants (n=40) responded and every participant answered all items of questionnaire.

### Data Analysis

Descriptive statistics were calculated for participant's characteristics/demographic data. Qualitative thematic analysis of data was done. Each response was carefully read to develop analytic codes. The selective codes were categorized and themes were developed<sup>12</sup>. The data were independently analysed by author and expert medical educationist and then corroborated to ensure analytical triangulation. During

the data analysis highlighted quotations were chosen.

**Table-II: COVID-19 impact on post graduate residents.**

Personal Life	Physical distress	"I am too much fatigued post call after performing duty for 24 hours---I am unable to do my daily morning walk' – gaining weight these days---. I am unable to eat properly---The restricted zoning, Wearing thick face masks, disinfection protocols and repeated hand washing need extra efforts---- Working with PPE for long hours in COVID positive ward is a major physical challenge".
	Psychological trauma	"Working with COVID-19 positive children is very oppressive and stressful job --I am suffering from easy irritability, mood swings, unexplained symptoms, depression and anxiety due to COVID-19 phobia. -- I am suffering from insomnia---always fear of being infected – scared from each other (colleagues)--Anyone who coughs in the office/ clinic/ ward causes panic."
	Self reflection	"I have plenty of time at home and started self reflection. – I had identified my few weaknesses and will try to improve-- I had lot of time during Ramadan for worship"
	Social isolation	"I was unable to attend marriage ceremony of my cousin due to lock down--unable to meet my relatives for last one month"
Family Life	More time for family	"I have plenty of time to spend with family at home--- I am regularly teaching my son and watching Turkish drama with family"
	More responsibility	"Our maid left the job and I myself is doing her duties like washing, cleaning and cooking--- I am sharing my 6 year old child school related needs"
	Contagion fear	"My parents are living with me and I am fearful to give this virus to them and my children from my hospital".
Financial Issues	Loss of job	"My husband has lost his job during this COVID crisis and it's an additional financial burden on me"
	Less expenditure	"We are not doing hoteling these days so saving money from my pay--- I have not spent anything on my dress or shoes for the last 2- month"
	More expenditure	"I have to expend extra money on transport, N95 and surgical masks these days"
Professional Impact	Motivational toil	"Very difficult to keep staff and self motivated now a days as our colleagues have become COVID +ve"
	Kid's parents emotional volatility	"Treating parents as well, not only the kid--we are not treating the disease only, treating the parents anxiety as well-- parents need emotional support--have seen parents in panic state"
	Compromised working environment	"Due to the surge of patients, we have to set up our neonatal unit in a temporary setting. It does not meet the full criteria of neonatal intensive care unit – even then providing care to neonates even referred from other cities"
	Multidisciplinary team work dynamics	"Doctors and nurses from different departments are performing duties in COVID-19 stable ward. We have to understand each other and collaborate- "
	Increased work load	"I have to perform duties in adult COVID positive patients due to redeployment of residents--I have to look after stable adult patients - I am doing it as general duty medical officer".
	Cumbersome Counselling task	"Counselling of parents of COVID Positive children is a very difficult task---they ask very funny and difficult questions and if not answered properly then they are annoyed"
	Paranoia phenomenon	"Some parents have paranoid features with unnecessary testing demand, medicine refusal, isolation refusal leading to conflict with me"
	Parents irrelevant attitude	"Some parents do not accept mask putting on face, frequent hand washing and social distancing. I have to tell them repeatedly but they don't accept it"
	Unrealistic expectations	"Even in this crisis some parents expect that resident must play with their kids and must do some sort of gupshup with them" -
Professional Training and Learning	Emergency learning compromised	"Emergency learning has decreased due to decreased number of patients in E&R"
	In- person classes decreased	"Due to social distancing we are not having any Tuesday common lectures at Armed Forces Postgraduate Medical Institute"
	Presentations skills compromised	"Department has cancelled Friday morning meeting. It was a great opportunity to improve presentation skills ---We are not doing long case presentations in our department due to hospital social distancing policy"
	Procedural skills affected	"I opted this hospital for training due to variety of cases and opportunity to practical procedures but it has been affected by COVID-19"
	Variety of patients decreased	"I do see only 10-15 patients after working hours and these are simple cases" ----Decreased workload has affected our learning"
	Research projects compromised	"My research project has been delayed as it involves face to face contact with parents----- I am unable to achieve my sample size due to decreased number of patients"
	In- person conferences postponed	"Neonatal and paediatric conferences have been postponed that was a great opportunity for learning- I was supposed to present a research paper but conference has been postponed"
	Telemedicine skills improved	"We are offering telemedicine services in our OPD and it has improved my IT skills"
	Intubation skills Compromised	"We have a great fear of contagion while doing intubation of patients and due to this fear sometime-- I am not successful in intubation"
	Post Graduation examinations uncertainty	"I have deposited fee for my FCPS exam but not sure about it whether it will happen or not"

**RESULTS**

Total six theme categories like personal, family, financial and professional impact were identified. Majority of participants were female 30 (75%), age range 31-35, (20, 50%) years, married, living with parents and caring neonates and paediatric patients (table-I).

**Personal, Family, Financial And Social Impact**

The participants reported an impact on their physical, psychological, family and social

number of clinical, procedural and emergency skills and decreased volume of out/in/emergency patients. Although they have acquired telemedicine skills (table-II).

**Suggestions Proposed By Residents**

They have suggested motivational videos, peer support, communication skills enhancement, e-learning strategies and sustained enough personal protective equipment supplies to fight and win war against COVID-19 (table-III).

**Table-III: Suggestions purposed by residents.**

Personal Protection Equipment (PPE) supplies	“Adequate and Sufficient personal protective equipments of different levels are the most important factor in this battle. We should protect our first line COVID fighters to win this war”
Psychological communication skills.	“From this Corona crisis I have learnt that if one is not good in communication skills, the doctor-patient relationship will be very bad- I think we need professional training in psychological communication skills.”
Support system to cope situation”	Support from peer, team leader and hospital is a great source for sense of safety and feeling that I am not alone-Such support systems should be available at all hospitals to cope with this crisis”.
Motivational on- line videos	“On line motivational videos should be available both for HCP (Health Care Professionals) and patient. These videos may be shown in wards”
Online learning	“We should increase online classes, procedural skills, presentations and Friday conferences to benefit residents ”

well-being. They experienced anxiety, insomnia, depression, extra responsibilities of family life and financial burden during this pandemic. Due to social restrictions and lockdowns, they could not attend marriage ceremonies and other social gatherings of their relatives. Some reported difficulty in reaching hospital due to non availability of public transport. A few reported having more time for their families and self reflection (table-II).

**Professional Life And Learning/Training**

Residents experienced a drastic change in their professional duties and residency training. They are facing problems of emotional support, difficult counselling, compromised working environment, paranoia phenomenon, irrelevant attitude of patients, unrealistic expectations and contagion fear. Their residency training is being skeptically affected due to disruption of hospital OPDs, modifications in resident consultant ward rounds, lack of in-person classes, conferences and departmental presentations, acquisition of less

**DISCUSSION**

This study found that participants physical and psychological stress levels are substantially higher than usual during pandemic. This pandemic has adversely affected their socialisation and well being. Our finding is echoed by many studies in literature<sup>13</sup>. There are definite psychological effects of infectious disease outbreaks as evidenced from severe acute respiratory syndrome (SARS) and pandemic flu (H1N1)<sup>14</sup>. The reasons for these inauspicious phenomenon are; phobia of being infected themselves and virus transmission to their families and parents<sup>15</sup>. Similar to this study, different grades of psychological impact of COVID-19 on Chinese population has also been reported<sup>16</sup>. To combat this stress effects on health care professionals, provision of emotional, social and mental health support to care provider should be available. Wilson *et al* suggested that senior colleagues should actively promote and advocate for trainees wellbeing<sup>17</sup>.

Many residents feel that they are sharing extra responsibility of adult COVID patients due to redeployment. But it's an international phenomenon and need of national emergency during this pandemic as reported by Waris *et al* and Remuzzi<sup>18,19</sup>. Every health care system has dual responsibilities of ensuring its residents/trainees speciality specific competencies to prepare them as independent physicians and simultaneously exceptional health care delivery to its dependents.

Social/physical distancing is an effective strategy to contain contagion spread but it may lead to social isolation. Social isolation/feeling of loneliness has unpredictable unpleasant effects. It's very necessary for trainees to remain connected via different online portals with their peers and relatives to avert social isolation. A significant impact on family life reported by our trainees has also been cited in literature<sup>20</sup>. Few residents mentioned about financial hardships and have to amend their life style and similar findings also reported by Mehta *et al*<sup>21</sup> Some of them are worried about their present job and future employments. Fear of relatives' safety is another reason for stress among trainees. Some of them said that their spouse and children are facing problems of anxiety, tension and school issues. Physicians' family plays a key role in maintaining an optimal mental health during this COVID crisis. COVID-19 started as a public health crisis but now has changed into a mental health, emotional and financial crisis. During initial days of pandemic people used to say, 'We're all in this boat together.' But reality has changed to "we are all in the same storm but in different boats" so we should help each other<sup>22</sup>.

Professionalism inauspicious effects experienced and remedial measures suggested by our residents are in line what Hall *et al* have purposed<sup>23</sup>. The participants reported seeing less volume of in/out and emergency patients and its similar as cited by Mehrotra *et al*<sup>24</sup>. It may be due to transportation difficulties, fear of contagion, cancellation and postponement of non-essential and non emergent services as reported by Sem-

man *et al*<sup>15</sup>. It is in unison what is reported in literature to remodel the environment and protocols to reduce transmittance by curtailing face-to-face visits and spacing face-to-face appointments.

Procedural skills like intubation/ventilation are being negatively affected as physical distancing has circumvented the traditional supervision of trainees. Residency clerkships are necessary for mentor-mentee relationship building and skill acquisition. Interventions and skill acquisition programs must balance the exposure risk versus educational/learning opportunity as purposed by Pepe *et al*<sup>25</sup>. Skills acquisition can be enhanced with use of virtual patients and simulation scenarios during this pandemic as advocated by Mouli *et al*<sup>26</sup>.

Residents reported that didactic and clinical learning involving in-person teaching has been skeptically affected due to physical distancing but its universal phenomenon during this pandemic as described by Kuy *et al*<sup>27</sup>. Consultant and resident ward rounds should include in-person only the necessary health care professionals with physical distancing. Research projects of our trainees have been suspended due to insufficient in-person participation, social distancing and laboratory problems and similar finding are reported in other specialities by Alvin *et al*<sup>28</sup>.

Many modifications in residency programs have been made all over the World to mitigate effects of COVID-19 on resident health and professional competencies. Let us try to innovate in new environment. Among these adaptations a few like decreasing resident staffing to 50% of normal, making different teams to rotate on weekly basis to lessen virus exposure have been theorised by Beshra *et al*<sup>29</sup>. Training is being shifted to virtual patient teaching and assessment. Novel technologies of smart learning, electronic medical communication and e-learning sponsored by national and international organizations must be explored. Residents have lost the opportunity for personal development through conference presentations. Medical conferences in-person have transitioned to virtual conferences

by using video conference technology. We must adopt synchronous and asynchronous virtual conferences. There are definite challenges but also opportunities with online presenting and teaching. Residents can benefit from online webinars. Knowledge, skills and attitudes domains are the pillars of residency training and how accurately these will be taught and assessed during this pandemic is an unresolved question. High fidelity virtual platforms can be attained and used to teach and assess clinical competencies<sup>30</sup>. How much online presentations and conferences can help in psychomotor skills and Attitudes is uncertain at present<sup>31</sup>. However traditional tools of assessment like multiple-choice questions, oral exams, simulation-based assessments, and workplace-based assessments can and should be used to assess competence<sup>23</sup>.

Shifting certain part of medical practice workload to telehealth will trim contagion fear among health care professionals' and patients. The American Association of Nurse Practitioners (AANP) has endorsed the term telehealth and recommends its use by every speciality<sup>32</sup>. So telehealth can be introduced as it will prepare the future physicians to integrate telecommunication in telehealth and dwindle virus exposure<sup>33</sup>.

There is uncertainty about the consequences of rapidly changing practices and their impact on health outcomes of paediatric patients. The anticipated changes include fewer visits to the health-care facilities, shortened lengths of hospital stay, disrupted immunisation schedules and fear of malnutrition and increased mortality as witnessed during previous infectious disease outbreaks<sup>34</sup>.

We have focused our discussion on impact of COVID-19 on our hospital residents, but we suppose that the omnipresence of the pandemic will have similar quivers everywhere in Pakistan. As an institution we cannot wait just out the COVID-19 pandemic rather we must promptly amend our training programmes without compromising patient care and trainees competencies. Although our training programme is time depen-

dent competency based but it's our collective responsibility to train justifiably competent paediatricians and provide optimal care to paediatric patients.

### LIMITATION OF STUDY

This was one centre and one speciality related study so generalisation cannot be made. The impact is still going on as pandemic is not over. Moreover in our hospitals standard operating procedures are already in place to work in disaster like conditions. Future research should explore the fears of residents and coping strategies to improve their job satisfaction and training during pandemics.

### ACKNOWLEDGEMENT

Authors would like to thanks all the participants for their time and contribution.

### CONCLUSION

COVID-19 pandemic is a new learning for everyone and posed unprecedented challenges to medical community and health care systems all over the world. Despite the different challenges residents are working with selflessness, dedication, devotion and pride. We will have formative and transformative experience that will benefit the future patients, trainees, teaching faculty and health care administratives. We should remain optimistic about its impact on residents experience in public health, patient care and crisis situation handling. Moreover they will emerge as leaders of future to handle such pandemic if ever occur. We must introduce new teaching-learning modalities like high fidelity manikins, virtual patients, simulation scenarios and telehealth to enhance resident's competencies.

### CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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