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  - Online & Print, Platinum Open Access, CC-BY
- **Frequency**
  - Quarterly with Special Issues
- **Launch Date**
  - 2020
- **Current Issue**
  - Vol 1 No 2 (May - July 2020)
- **Indexation**
  - Google Scholar
  - OpenAIRE
  - Neliti
  - BASE
  - Worldcat OCLC
- **Digital Archiving**
  - Bi-monthly on Portico
- **Plagiarism**
  - Turnitin
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  - Crossref
- **Peer Review**
  - Double Blind Peer Review.
- **Manuscript Submission System**
  - Publie
- **ISSN**
  - 2708-0285 (E)
  - 2708-0277 (P)
- **Official Emails**
  - editor@pjsm.com.pk
  - chiefeditorpjsm@gmail.com
- **Privacy Policy Statement**
  - April 2020
- **Official Twitter ID**
  - https://twitter.com/pakjsurgmed
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Lonely death and no relation at last rights, this may seem like the ending of an incredibly sad film, but unfortunately, it has become the reality of people infected by the presently-pandemic microbe, the Coronavirus; specifically a novel strain of it, the COVID-19 virus.[1] COVID-19 is one strain that wasn’t previously identified in humans. It first showed signs of its existence in late 2019 in Wuhan, China, where the reported case of the individual developed a mysterious illness, that proceeded to show worsening signs of the acute respiratory disease started.[2] From there, in just a matter of months, it has caused a large and ongoing outbreak. Since then, there have been thousands of confirmed cases and alarmingly increasing deaths worldwide. Recent evidence suggests that it is transmitted between people through droplets, fomites, and close contact, with possible spread also through secretions and feces.[3]

This is a new virus whose source and disease progression are not yet entirely clear, hence more precautionary measures are a necessity until more and definite evidence is available about its mode of progression. Ever since the first person passed away from this utterly infectious malady, it became quite clear that the proper last rituals of the suspected or confirmed case of COVID-19 were an urgent necessity, with each situation to be managed on a case-by-case basis, balancing the rights of the family, the need to investigate the cause of death, and the risks of exposure to infection. Hence, an efficient protocol of dealing with the infected corpses has to be devised as a national action plan to combat the risks involved during the transportation, handling and if needed, postmortem examination of the dead body. A separate set of guidelines for the systemic burial of the departed soul should also be set forth to assure the maximum limitation of the spread of the disease while maintaining the dignity of the deceased. Considering the contiguity of this virus, it only makes sense that the health care workers and all other associated personnel such as, funeral directors and mortuary staff, in close contact with the corpse be given utmost priority. The safety and well being of all the handlers ought to be ensured by providing all, necessary resources for keeping them out of harm’s way, which includes both structural equipment like PPEs (i.e. gloves, gowns, face shields, N95 masks, goggles, shoe covers, etc.), sanitizers, clean autopsy tables, and working environment. Also, comprehensive instructions to follow, allowing minimum fanning out of the infection to healthy individuals including themselves, which may include providing training in hand hygiene and how to put on / remove PPEs.

Hence after the death of the patient, the first and foremost thing is the complete protection of the staff, ensuring all protective precautions. After covering yourself up according to the extent of the task at hand, the body is to be wrapped “up in a cloth” and transferred to a mortuary ASAP, while ensuring all orifices are closed and bodily fluids are contained. In accordance to WHO guidelines, cadavers lack the ability to spread infections; however, as reported by an authentic news source, Thailand had allegedly the first fatal case of the infection transmitted from a dead patient to a medical examiner, a finding that added to the safety concerns for morgue and funeral home workers amid the global pandemic.[4]

“[C]OVID-19 is a respiratory pathogen and can be transmitted via respiratory droplets, but also through the blood of a viremic patient. Even though decedents don’t cough, they can expel bodily fluids while they are being moved or transported, “she explained.[5]

Hence some additional precautions to be taken into
account while managing an infected dead body's transport to a mortuary include:

- Avoiding unnecessary manipulation of the body that may expel gas from the lungs.
- Ensure all orifices of the body are plugged and handler is covered enough to avoid any splattering.
- Prepare the body for transfer including removal of all lines, catheters, and other tubes.
- Adults >60 years and immuno-suppressed individuals should not directly interact with the body.
- Allow the family to view or touch the body only following strict precautionary measures, including washing hands before and after.

When the body arrives in a morgue, the decision to perform an autopsy is made. In areas where there is a known pandemic, the autopsy is not required in patients with diagnosed COVID infections, and a mere chest X-ray, extraction of a Nasopharyngeal swab specimen and the patient's complete history is enough to deduce whether the patient has died of corona or not.[6] However, in cases where a John Doe or a Jane Doe is brought over by the police, a postmortem is done to confirm the cause of death and that may turn out to be a neglected case of the virus outbreak. Hence, even the police handling such bodies in an open pandemic area, ought to take the same precautionary measure, as health care providers. Proper gloves, face mask and performing hand hygiene as they return home after a long day’s work, is thus, just as important for the Law Enforcement Agencies (LEA), as for health care providers. Especially, since they’d be dealing with more people every day similar to doctors and this may resort to playing a role in spreading the infection. Unfortunately, neglect has caused infection among the brave officers of LEAs involved; one such example would be of a 38-year-old civilian dispatcher policeman of the Detroit Police Department dying of COVID-19. After which 282 policemen self-quarantined.[7]

Moving on, let’s address the morgue situation and environmental control measures necessary if an autopsy has to be performed. Important initiatives are:

- Embalming the dead body is not to be allowed.
- The autopsy room and all its contents must be sanitized thoroughly with 1% Sodium hypochlorite.
- Only a minimum number of staff ought to be present in the autopsy room.
- Staff must make use of the PPEs available and be well-trained in infection prevention control practices.
- Autopsy procedure should be carried out keeping in view the measures considered during routine procedures (i.e. must be a well-lit room, with enough ventilation, etc.)
- Reduce aerosol generation during autopsy using appropriate techniques especially while handling lung tissue.
- Negative pressure ventilation to be maintained in the mortuary.
- Round ended scissors should be used.
- At the end of the procedure, the body should be disinfected with 1% Sodium Hypochlorite and placed in a body bag, the exterior of which will again be decontaminated with the same solution.
- Thereafter the body can be handed over to the relatives.

The relatives can then perform their burial rituals, as desired. Some families may prefer handing the body over to funeral directors so that the standard precautionary measures can easily be brought to action and proper arrangements are made. It is significant to note in some cultural institutes of specific societies, cremation is preferred over the burial ritual. Some sources believe that the perfect route to disposal of infected vessels is cremation, as it completely rids of the entire body by burning its entirety to ashes. Still, other religions accept a proper burial as the only way of ‘resting in peace’, their deceased. This decision requires consideration of the religious and cultural perspectives of the family of the deceased, and it is our responsibility to uphold the dignity of both the alive and the dead. In the Islamic Republic of Pakistan, we have put forward the disposal in a plastic well-compacted bag as the best choice of laying down the dead, and perform the Islamic ritual of praying in congregation, funeral prayer, to seek pardon for the expired Muslim; but of course, the standard protocol has to be followed, by limiting the number of persons and maintaining a safe distance of about 2 meters or more between each attending Individuals. The risk from not following protocol is catching the horrible disease, which may be mild like dry cough and fever, to severe COVID dragging the patient down to his deathbed.

The physicians can only provide the symptomatic treatment, helpless if souls start leaving their bodies despite providing the highest quality of medical care. Known definite risk factors are old age, underlying illnesses (e.g. diabetes, heart disease, AIDS, etc.) but we have yet to figure out the risk factors for healthy young patients.

“One day they’re okay, the next day they require intubation. [It’s] one of scariest parts of this
disease,” says Dr. Rochelle Walensky, Chief of infectious diseases at Massachusetts General Hospital. Thence, such an enigmatic pathology ought to be dealt with the greatest caution. These perilous times call for absolute dedication by the Messiah of our nation, and & it is their principle right and our foremost duty that we follow each and every protocol set forth to play our part in flattening the curve.

REFERENCES


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CONFLICT OF INTEREST
The author declared no conflict of interest

E-OP
We Value your Opinions. Register your Opinion to this editorial by Malik AR et al. by clicking here.
It is human to err; and the only final and deadly error, among all our errors, is denying that we have ever erred.[1]

Due to an error, the generated digital object identifiers (doi) for the following articles of Pakistan Journal of Surgery and Medicine (Pak J Surg Med) Volume 1 Issue 1 had to be regenerated[Table 1].

This happened because we didn’t have an open journal system (OJS) at that time which has been corrected. The said OJS is now fully functional.[2] Pak J Surg Med believes in upholding the highest levels of medical journalism, adhering strictly to International Committee of Journal Medical Editors (ICJME) guidelines & World Medical Association Declaration of Helsinki.[3, 4]

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Table 1: Article Details along with defunct and updated doi numbers

REFERENCES
Dear Sir,

I have read with interest the article by Kamran M et al. [1] I would like to highlight that misadventures occur when details are omitted from history. It is essential that a doctor gains the trust of his patient and obtains information regarding taboo topics (sexual relations, drug abuse etc) as well. However, there are instances when the health and safety of another individual is also at risk (Epidemics, STDs, Corona Virus, etc), and then this oath is deliberately broken. It is the onus of doctors to uphold their oath of providing the best medical diagnosis and treatment to the concerned parties. Often times, to do so means to violate the terms of confidentiality, but in good faith.

Thank You.

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The author declared no conflict of interest

E-OP
We Value your Opinions. Register your Opinion to this E-OP by Mustafa B. by clicking here.
The association between cannabis use and testicular germ cell tumor

Letter to Editor


1. Students, Third year MBBS, Dow University of Health Sciences, Dow Medical College, Baba-e-Urdu road, Saddar, Karachi, Pakistan.
2. Student, Final year MBBS, Dow University of Health Sciences, Dow Medical College, Baba-e-Urdu road, Saddar, Karachi, Pakistan.
3. Medical Officer, Dr Ruth K.M Pfau Civil Hospital, Dow University of Health Sciences Karachi, Pakistan.

Sir,

The prevalence of drug abuse is rising at an alarming rate with cannabis as the most popular drug used in Pakistan. Per the United Nations Illicit Drug Trends Report on Pakistan, cannabis is a drug of choice and the most commonly abused substance since it is cheaply and easily available for recreational purposes.[1] Additionally, the findings of the survey conducted by Bajwa et al to determine Cannabis trends in 2013 revealed approximately 4 million cannabis users in Pakistan.[2] The term Cannabis, also known as marijuana, denotes the variety of psychoactive constituents including d-9 tetrahydrocannabinol derived from the plant Cannabis sativa. It carries a spectrum of psychological and physical manifestations including altered state of consciousness, euphoria, relaxation, and increased appetite.[3] Cannabis is widely used for medical purposes to improve chemotherapy-associated vomiting and nausea, to increase appetite in AIDS/HIV patients, and to treat body pain and muscle spasms. However, there are a variety of adverse side effects associated with cannabis use including confusion and memory loss, delusions, hallucinations along with anxiety, and agitation. Additionally, Chronic bronchitis leading to excessive coughing with the production of sputum and wheezing is a clinical manifestation observed in chronic heavy cannabis smokers. Moreover, the consistent use of cannabis in young adulthood leads to an increased risk of schizophrenia and psychotic symptoms. Andreasson et al in his study reported that the proportion of sample population that consumed cannabis before an age of 18 years was 2.4 times more likely to suffer from schizophrenia than those who had not.[3] The striking findings of very recent meta-analyses conducted by Ghasemiesfe et al. demonstrated an association between the usage of marijuana and the development of testicular germ cell tumors. The three case-control studies pooled evaluated young participants with a mean follow-up period of 6.6 years. The findings of the pooled analysis revealed that more than 10 years of marijuana use increases the risk of testicular germ cell tumor development by 36% (Odds Ratio, 1.36; 95% CI, 1.03-1.81; p = 0.03; I2 = 0%). Additionally, sub-analysis according to histological type showed more than 10 years of marijuana use to increase the risk of non-seminoma testicular germ cell tumor development by 85% (Odds Ratio, 1.85; 95% CI, 1.10-3.11; p = 0.04; I2 = 0%).[4]

Since only three studies were pooled, this shows a lack of studies in this area. Therefore, indicating a dire need for studies focusing on the use of cannabis, due to its devastating adverse effects. The important findings of this study cannot be ignored keeping in mind the vast prevalence of cannabis use in Pakistan. Health professionals must inform the general public about the adverse effects and informational brochures be distributed to the general population visiting private and public hospitals in addition to educational awareness sessions to reduce cannabis use in the Pakistani population.

Thank You

REFERENCES

3. Andreasson S, Engstrom A, Allebeck P. Cannabis and schizophrenia: a longitudinal study of Swedish...


AUTHOR CONTRIBUTION
FY: Design, drafting & submission
RKO: Concept, design, drafting & submission
AJM: Bibliography
SAF: Drafting

HOW TO CITE

CONFLICT OF INTEREST
The author declared no conflict of interest

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MANUSCRIPT PROCESSING
Submission: PJSM-2020-000162-O-22-Apr-2020
Processing:
PJSJ-2020-000162-P-30-Apr-2020
PJSJ-2020-000162-P2-30-Apr-2020
PJSJ-2020-000162-A-30-Apr-2020
PJSJ-2020-000162-R-11-May-2020
Acceptance: 30-Apr-2020
Publication: 11-May-2020

PUBLISHER'S NOTE
The views and opinion expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any other agency, organization, employer or company.
HIV outbreak in Pakistan – a wake-up call?

Letter to Editor

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Sir,

The human immunodeficiency virus (HIV) is currently a global threat with an estimated 37.9 million people worldwide live with HIV-1, out of which 32 million have already died.[1] Globally, in 2005 alone over 4 million people were infected, and 3 million people perished from the disease.[2] In the following decade, thirty-eight thousand new cases have been recognized annually according to the Centers for Disease Control and Prevention (CDC).[3] Even though infection rates have remained stable since the 1990s in the US, the story in developing countries like Pakistan is altogether different.[3] The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that since 2004, the total cases of HIV in Pakistan have gone from 2700 cases to 130,000 cases, which is a staggering increase of 4800 percent.[4]

Furthermore, developing countries continue to bear the load of the most HIV infected individuals with Sub-Saharan Africa alone having almost 25 million individuals from a total of 38.6 million people infected globally until 2007.[5] In light of these devastating numbers, the sudden outbreak of HIV in Sargodha, a city in Pakistan with a population of 1.5 million people, requires immediate attention from the global medical community, especially in developing countries which share the same high-risk status for HIV infections like Pakistan, so that precautions can be taken to prevent this from happening again.[6, 7] Dawn News reports that in the past decade, Sargodha has had one of the most HIV infected populations in Pakistan with over 800 people being carriers.[7] In 2017, 37 people were diagnosed as carriers of HIV, and it was found that they had all gone to the same self-proclaimed doctor, practicing without a license, and would re-use syringes, leaving these people infected with HIV.[7]

A recent outbreak occurred in June 2019 in Laranka, Sindh in which a tested population of 26041 people, confirmed 751 cases of HIV/AIDS, constituting 2.88% of the total population, however, the precise reason for this is still unknown. A large number of people tested was done in accordance with WHO guidelines on HIV treatment which recommends a test-and-treat strategy.[8] In a comprehensive review of the literature done in 2011 over the AIDS epidemic in Pakistan, the study stated that the reasons underlying the presence of HIV are due to Pakistan being a developing country.[9] Since 2007, a consistent increase in the usage of drugs and narcotics has been seen in the Pakistani youth.[10] Additionally, truck drivers constitute a significant population living in the rural areas of Pakistan; hence, during the time away from home, they tend to have sexual intercourse, usually without protection, with young boys who are usually the helpers and other fellow workers.[10] Furthermore, barbers in Pakistan are not aware of the spread of HIV, and the routine of reusing razors has added to this troublesome situation. Such practices lead to the spread of the virus on an even bigger scale, and therefore should be discouraged.[10]

In light of these events, we urge Health Regulatory Bodies in Pakistan and other developing countries to thoroughly investigate individuals claiming to be doctors especially in areas that have low-income and low-literacy populations and are hence, susceptible to such fraudulent and potentially lethal practices. These events re-iterate the importance of raising public awareness towards proper sanitary practices, especially regarding any local practices which can result in blood-borne infections to be transmitted.
such as re-using of blades by local barbers in this particular case.[11, 12] This also raises the critical issue of public dialogue regarding contraceptive and sexually transmitted infections (STI) prevention practices such as the employment of condoms in countries similar to Pakistan where the majority of the discussions about sexual practices are considered taboo and invite great criticism from the public, along with the illicit use of drugs by needles is making it an even greater issue.[13]

A single intervention will not prove to be effective. The need of the hour is a customized, combined intervention plan with a specific focus on the target population, that can prove to be much more effective, including, but not limited to, public awareness campaigns regarding HIV and its transmission combined with sex-education in schools focusing on practicing safe sex, as well as government-endorsed mandatory check-ups for sex workers.[12]

REFERENCES


The effect of physical activity on stress levels of medical students: A cross-sectional analysis

Original Article

Background: Medical students are well known to work long hours, have financial difficulties, and face intense competition to succeed which may predispose them to significant psychological stress. Physical Activity may provide relief to stress in this population.

Objectives: To evaluate the effect of physical activity on the reduction of stress in medical students in a developing country.

Methods: Between April and May 2015, medical students at a private medical college within Karachi, Pakistan participated in a cross-sectional study to evaluate physical activity and stress levels. Questionnaires were distributed to all medical students by convenience sampling. A three-part questionnaire was developed based on the Perceived Stress Score to evaluate for the presence of stress. Patient demographics, Perceived Stress Score, participation, and the total duration of physical activity per week were obtained. Participants were also instructed to answer questions on other activities that they may be performing with the intention to relieve stress.

Results: A total of 235 participants were identified for further analysis. Based upon the Perceived Stress Scale (PSS), 30.3% of the medical students were found to have evidence of the stress with a mean PSS score of 16.95 ± 5.72. Participation in physical activity was found to cause a reduction in stress levels with medical students not reporting exercise is twice as likely to be stressed (OR 0.48, p = 0.015). In addition, the total duration of physical activity per week (>4 vs <2) was seen to be independently related to reduced PSS score (16.2 vs 18.2, p=0.028).

Conclusion: Both participation and longer duration of physical activity per week are associated with a significant reduction in stress levels within medical students.

Keywords: Stress, medical student, exercise, activity, burnout, college

INTRODUCTION
Psychological stress is a term synonymous with a perception of increased pressure which occurs when an individual may not adequately cope with demands expected of them.[1] This pathology is widely recognized to be experienced by medical students, residents, and early physicians undergoing medical education and training resulting in a significant effect on their mental health.[2]

A well-established link exists between mental health and physical activity; a meta-analysis of experimental and observational studies revealed that exercise improves stress levels within both healthy individuals in addition to those with psychiatric and emotional disorders.[3] Current data suggest that participation in moderate-intensity physical exercise for a period of 15 to 30 minutes per day results in a reduction of stress, anxiety, depression, and mental health disorders within the general population.[4, 5] The improvement in mental health-related symptoms has been attributed to a reduction in distraction and cognitive dissonance while simultaneously improving self-efficacy.[6]

A biochemical hypothesis for these changes in anxiety, depression, and other mood disorder may be best explained by the monoamine and endorphin hypothesis.[6] The hippocampal 5HT1A receptor-mediated AMP/PKA/CREB signaling pathway disturbance results in a depressed mind, it is thought that this signal pathology is improved by chronic exercise which subsequently produces improved mental health outcomes.[7]
Depression is typically managed with a combination of psychological and pharmaceutical therapy, however, there may be a significant benefit in symptom control by the addition of alternative approaches such as physical activity.[8] In the evaluation of stress, the gold-standard remains the perceived stress scale; this 14-item questionnaire contains 7 positive and 7 negative items, each of which is assigned a numerical value between 0-4 based on symptoms, subsequently, the sum of 7 negative stress questions are subtracted from the sum of the 7 positive questions to establish a final score.[9]

Although the use of physical exercise to improve symptoms of mental health in the general population, the specific effect of this physical activity on medical students in a developing country is less well known. We hypothesize that a reduction in stress levels may be seen with physical exercise. Subsequently, to evaluate this we evaluated the effect of physical activity and stress based on the perceived stress scale.

MATERIALS AND METHODS
A cross-sectional survey was distributed to medical students between April and May 2015 in a private medical college associated with a tertiary care hospital within Karachi, Pakistan. Before the initiation of the study, consent was obtained from all participating medical students with written informed consent which was supervised by the ethical review committee. Medical students from all years (1-5) were included for participation in the study regardless of whether they reported regular participation in physical activity or not. Convenience sampling was utilized to select subjects for survey distribution however to reduce selection bias, attempts were made to distribute the survey evenly between all five groups. The initial section of the questionnaire queried the medical students' demographic information which consisted of the participants’ age, residence (on-campus residence vs off-campus day scholar), and year of medical school enrollment. Also, the survey inquired about frequency, type, and total time spent on physical activity for 1 week. The second part of the survey evaluated stress levels within the participating medical students, the questionnaire utilized assessment based upon the Perceived Stress Scale.[9] A 5-point scale, from a minimum of 0 (rarely) to 4 (almost always) was used to evaluate responses. The questionnaire was not modified from its original form. Answers to negative questions were summed together followed by subtraction from the sum of positive questions. Participants with a Perceived Stress Scale score of < 20 were identified to not be stressed however participants with a score of ≥20 were acknowledged as being stressed.

The third part of the survey comprised of questions regarding alternative stress-relieving practices employed by medical students who were not related to physical activity. Medical students were not given limited choices to answer these questions and were free to report any activity which relieved stress for them such as hobbies or meditation.

The appropriate sample size for the study was calculated by a descriptive study open-source calculator with OpenEpi software version 3.0. Precision for the study was maintained at 5% with an anticipated stress percentage frequency of 50% which resulted in a total calculated sample size of 218. The sample size was inflated to 235 given anticipation for refusal of participation and non-responders. EpiData version 3.1 was utilized for data entry and collection. The data was subsequently transferred to a Microsoft Excel Sheet following which analysis was completed by IBM SPSS version 19.0. A total of 4 response questionnaires had incomplete data and were subsequently removed from the final analysis. Tables related to baseline demographics and between physically active medical students was established. A bar chart illustrated the correlation between physical activity per week and Perceived Stress Scale scores. Subsequently, odds ratios were calculated for variables to locate significant factors.

RESULTS
A total of 235 participants met the inclusion criteria for the study. Table 1 describes the demographic characteristics, participation in physical activity, and stress levels of the medical student subjects. Although both males and females were represented in our study sample, the later were marginally more frequent (52.8%). Third-year medical students were the most represented class (30.2%) whilst a majority of the participants resided in university housing (59.1%). Participants were aged between 17 and 27 years with a mean age of 21.44 ± 1.663 years. A large portion of the study population (72.3%) were physically active and were involved in a minimum of 1 form of exercise. Medical Students most frequently reported running (45.5%) as their preferred form of physical activity although jogging (29.8%), swimming (27.7%), football (23.0%) and floor exercises (23.0%) were also popular. Less frequent but other reported activities included dancing, horse riding, martial arts, and tae-kwon-do. Study participants who reported physical activity most...
Table 1: Demographics, participation in physical activity, and stress levels of the subjects.

<table>
<thead>
<tr>
<th>Baseline Characteristics</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (n=235)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>111 (47.2)</td>
</tr>
<tr>
<td>Female</td>
<td>124 (52.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year of Study (n=235)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Residence Status (n=235)</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-campus residence</td>
</tr>
<tr>
<td>Day Scholar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Activity (n=235)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stress Level (n=231)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insignificant</td>
</tr>
<tr>
<td>Significant</td>
</tr>
</tbody>
</table>

Table 2: Relation between stress with physical activity and other stress relieving factors

<table>
<thead>
<tr>
<th></th>
<th>Stress n(%)</th>
<th>No Stress n(%)</th>
<th>P-value</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical activity +</td>
<td>43 (25.7)</td>
<td>124 (74.3)</td>
<td>0.015</td>
<td>0.475</td>
</tr>
<tr>
<td>Physical activity -</td>
<td>27 (42.2)</td>
<td>37 (57.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consistency of physical activity +</td>
<td>24 (22.4)</td>
<td>83 (77.6)</td>
<td>0.125</td>
<td>0.578</td>
</tr>
<tr>
<td>Consistency of physical activity -</td>
<td>20 (33.3)</td>
<td>40 (66.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Imagery +</td>
<td>27 (25.0)</td>
<td>81 (75.0)</td>
<td>0.084</td>
<td>0.605</td>
</tr>
<tr>
<td>Mental Imagery -</td>
<td>43 (35.5)</td>
<td>78 (64.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breathing Exercises +</td>
<td>15 (25.9)</td>
<td>43 (74.1)</td>
<td>0.381</td>
<td>0.742</td>
</tr>
<tr>
<td>Breathing Exercises -</td>
<td>55 (32.0)</td>
<td>117 (68.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meditation +</td>
<td>17 (25.8)</td>
<td>49 (74.2)</td>
<td>0.342</td>
<td>0.733</td>
</tr>
<tr>
<td>Meditation –</td>
<td>53 (32.1)</td>
<td>112 (67.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Hobbies +</td>
<td>42 (26.3)</td>
<td>118 (73.8)</td>
<td>0.044</td>
<td>0.547</td>
</tr>
<tr>
<td>Personal Hobbies -</td>
<td>28 (39.4)</td>
<td>43 (60.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extracurricular activities +</td>
<td>32 (27.4)</td>
<td>85 (72.6)</td>
<td>0.319</td>
<td>0.743</td>
</tr>
<tr>
<td>Extracurricular activities -</td>
<td>38 (33.6)</td>
<td>75 (66.4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

commonly stated that they were involved in the chosen activity for an average of 2-4 hours per week (22.6%). A minority of medical students reported involvement in physical activity for > 5 hours per week (15.0%). A total of 70 participants (30.3%) were classified to be stressed based on the Perceived Stress Scale. The number of participants with each calculated Perceived Stress Scale score (PSS) is shown in the bar graph in Figure 1. Medical students had PSS scores which were between 2 and 30 points. The mean PSS score was 16.95 ± 5.72 whereas the median PSS score was 17. A large portion of the participants had a borderline PSS.
score of 20 which was associated with a diagnosis of stress. Population distribution was negatively skewed. A significant co relation was witnessed between physical activity and stress levels within medical students (p=0.015). Evaluation of secondary factors and stress levels in medical students is compared in Table 2. Medical students who took part in their hobbies were found to be significantly less stressed (p=0.044), however other secondary factors including meditation, breathing exercises, mental imagery, and extracurricular activities were not associated with a reduction in stress. The participation of medical students in consistent physical activity was likely to result in stress reduction, however, statistical significance could not be attained.

Perceived Stress Scale scores and physical activity were compared utilizing one-way ANOVA with stratification based on several hours per week, (< 2 hours, 2-4 hours, > 4 hours). The duration of physical activity was associated with a reduction in stress level (F=2.475; p=0.008). Post-hoc statistical analysis was completed with Fisher's test. Medical students with >4 hours of exercise per week had a significantly lower PSS score (-2.94, p=0.028) when compared to participants with a total duration of the exercise of < 2 hours per week.

DISCUSSION

Females were slightly more populous within the study population (52.8%), this is in-line with prior reported literature on higher female prevalence within medical schools, and given this, it may be presumed that our reported findings may be generalized to other medical students.[10-13] A drawback of convenience sampling is an unequivocal number of participants from each medical school year with first (17.9%), second (7.7%), third (30.2%), fourth (29.8%), and fifth (14.5%) year students. Prior literature has suggested that disparities exist between prevalence and management techniques of stress within different years of medical school enrollment with a recent study, which utilized the Perceived Stress Scale reported that 59.7% of students suffered from stress.[19] These confounding factors can result in lower participation in physical activity and lead to the discrepancies seen in the literature. Participants were characterized as stressed (≥ 20) or non-stressed (<20) based on the Perceived Stress Scale questionnaire.[9] A minority of medical students demonstrated significant stress (30.3%) which was found to be lower than both national (41.7%) and international (49.0%) data.[14, 16] Results may have been confounded with medical students participating in the study within 1 week of their exams. Despite this, other cross-sectional studies have shown similar results with a questionnaire-based study reporting stress was associated with predisposing psychosocial (OR 5.01, 95% CI 2.44-10.29) and academic-related (OR 3.17 95% CI 1.52-6.68) factors in medical students.[16] The reason for stress in medical students is broad, with common factors including high workload, parental expectations, exam frequency, extensive curriculum, financial pressure, isolation, and frequent self-reflection on plans which cumulatively result in a detrimental effect on academic performance (r = -0.099, p > 0.05).[17]

To help alleviate or reduce stress the involvement in sporting and social activities has had positive effects. [14] The use of exercise has particularly been helpful in students, with the population reporting improved capability to cope with stress and emotional trauma of medical school.[18] Our study validated these claims; of the 170 medical students who stated they took part in physical activity, 74.3% were found to have insignificant levels of stress in their life. In contrast in participants who denied physical activity, 42.2% were
categorized to have stress. There was a significant difference between those who did or did not exercise (p=0.015).

Confounding factors were evaluated within the 3rd portion of the questionnaire. Open-ended questions were inquired from medical students concerning activities utilized by them to de-stress. Medical students stated that they participated in personal hobbies, social interaction, meditation, mental imagery, breathing, and extracurricular activities to help alleviate stress. These activities were analyzed concerning the presence of stress with involvement in personal hobbies the only significant factor to reduce stress in participants (p 0.044, OR 0.547, 95% CI = 0.26-0.87). Physical activity was found to significantly reduce stress levels in medical students in our study and the prevalence of stress was approximately two times more in participants who did not participate in physical activity. Besides, a positive correlation was found between the total duration of exercise per week (>4 hours vs <2 hours) and reduction in stress levels (mean difference of PSS score -2.94, p=0.028). Hence our study associates physical activity with a reduction in stress level.

**CONCLUSION**

Our results indicated that medical student involvement in physical activity results in a significant decrease in observed stress levels. Besides, a longer total duration of exercise per week can result in further improvement in stress levels. Medical students are likely to experience more stress than the general population and management are of this pathology is of utmost importance. We recommend that curriculum changes be considered to allow more exercise dedicated time for medical students. Besides, medical students should be screened for stress and be given appropriate help if deemed at risk.

As with other cross-sectional studies, our analysis was limited due to the inference between causality and temporality. Although physical activity likely relieves academic or psychosocial stressors, given our study design we cannot conclude this with certainty. Prospective cohort studies may be performed in the future to help correlate physical activity with the incidence of psychological symptoms. We also believe recall bias may have occurred due to the distribution of a self-administered questionnaire. Given our study involved a single medical school, generalization of results to academic institutions across the globe may be difficult.

**REFERENCES**


AUTHOR CONTRIBUTIONS
NB, NB & MNK did Data Collections, Article Writing, statistical analysis & manuscript submission. AA, AA, DS, MHB, AM, AM & ISK were involved in data collection. SS did supervision of whole process.

ETHICAL CONSIDERATION
Institutional Review Board of the Aga Khan University granted ethical approval to authors on 29 June 2015.

HOW TO CITE

CONFLICT OF INTEREST
The author declared no conflict of interest

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MANUSCRIPT PROCESSING
Processing:
PJSM-2019-000167-P-19-Dec-2019
PJSM-2020-000167-E-22-Jan-2020
PJSM-2020-000167-C-11-Mar-2020
Acceptance: 27-Apr-2020
Publication: 11-May-2020

EDITORIAL TEAM
Lead Editor: S Masud
Editor: AA Sheikh
Proof: K Zahra
Bibliography: A Sarfraz

PUBLISHER NOTE
The views and opinion expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any other agency, organization, employer or company.
Assessment of psychosocial work environment of doctors

Original Article
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2. KEMU, Lahore.

ABSTRACT

Introduction: Psychosocial work environments pertain to interpersonal and social interactions and it can influence behavior and development in the workplace. Objective: To test a comprehensive and theory-based psychosocial work environment questionnaire, and analyze associations with mental health in a sample of doctors in a tertiary care hospital in Lahore, Pakistan.

Methodology: It was a cross-sectional study, conducted at Shaikh Zayed Hospital (SZH) Lahore, from March 2017 to June 2017. A sample size of 100 working doctors was selected. The technique was non-probability. After informed consent, each doctor was given the NRCWE’s Copenhagen short questionnaire consisting of 39 questions. The analysis of data was entered in SPSS 21. The frequency of obtained data was calculated and demographic variables were elaborated. Independent t-test sampling was applied, and tables and pie chart were drawn.

Results: This study included worse working conditions in terms of stress, burnout, work-family conflict, and social support from superiors. High levels of stress and burnout were found. Doctors were almost satisfied with their jobs (scores near to average but less than average). Male doctors were found to be more satisfied with their jobs than female doctors.

Keywords: work environment, burnout, stress.

INTRODUCTION

Psychosocial work environment assessment informs us about the psychological and social issues faced by the employees. When one works at a place, a safe environment and occupational health are the foremost challenges faced by an individual. The reason for the demand for a safe and healthy environment at the workplace is continuously evolving due to the nature of work and the impact on the people doing it. The well-being of a human is influenced by the environment and type of work. The International Labor Association defines psychosocial risk in terms of the interaction between work content, work organization and management, working conditions, and the skills and needs of the workers.[1] It has been proven that the employees face different risks to their health. The existing literature suggests the need for identifying psychosocial risk factors such as labor demands, workplace ethics, equality, values, physical fitness, and offensive behaviors.[1] These psychosocial risk factors related to the workplace are associated with mental health problems. Levels of stress at the workplace, the extent of concentration, time demanded by each job, and effort-yield imbalance have a great role in predicting mental health problems.[2] According to a study done in six dental institutions of Rawalpindi and Islamabad, a significant percentage of dentists in Islamabad were struggling with moderate to severe depression.[2] According to “Karasek’s Job Strain model”, high strain jobs result in anxiety, depression, and physical illness. In Japan, the incidence of mental health problems is on the rise in the professional population and thus, the primary prevention of mental health problems and maintenance of emotional well-being are the most important priorities of authorities and the workers themselves.[3] Out of all mental health problems, depression is the most common one mental health among employees that is characterized by persistently low mood, decreased interest, feeling of poor self-worth, suicidal behaviors, and vegetative symptoms.[2, 3] It can be highly associated with the environment; a person is living or working in. A study
conducted (2016) among post-graduate residents in German hospitals reported depression among 9% of the participants. The distress level varied significantly among specialties with the most significant stress among Surgeons and Anesthesiologists.[4] Besides depression among doctors, other mental health issues were burnout, emotional exhaustion, and stress. In another study among Japanese psychiatrists in 2013, emotional exhaustion was found to have an association with the workplace environment too. Emotional exhaustion has been shown to have an inverse relationship with an appreciation of the magnitude of personal achievement.[5] Moreover, another study conducted to assess the magnitude of mental disorders in European countries showed that organizational justice and workplace social conditions particularly bullying were significantly associated with stress levels.[6] The time duration of job/service was another factor affecting health in various aspects. Physicians employed for a lesser time were in a healthier state as compared to doctors who had been working for a long time.[7, 8]

**RATIONALE**

There is a lack of regional & local data with regards to the psychosocial work environment of doctors, highlighting the need to conduct this study. It focused on the qualitative assessment of six variables which included stress levels, satisfaction from the job they are doing, self-rated health, burnout, work-family conflict, and social support from the superiors at work. We hope that our study will add to existing national and international literature and in the long run, will help in the improving psychosocial work environment of doctors.

**METHODOLOGY**

**Ethical Consideration:**
We got approval from the institutional review board vide letter number SKZMDC/DPHCM/399/19.

**Study population:**
A cross-sectional study was conducted among the doctors of Shaikh Zayed Hospital (SZH), Lahore from March 2017 to June 2017, to evaluate the psychosocial determinants affecting the work environment. A consecutive (convenient) sampling method was used. A sample size of 100 working doctors (n=100) was selected, belonging to any age group, irrespective of marital status and designation in the hospital.

**Data Collection:**
We used the National Research Centre for the Working Environment (NRCWE), Denmark’s short questionnaire, which consisted of thirty-nine questions. The psychosocial work environment was evaluated with fourteen parameters from the NRCWE questionnaire (version 1) which focused on three main areas viz a viz:

- **Demands at work**
- **Inter-personal working relationship with colleagues**
- **Workforce organization**

**Data Analysis**
We analyzed the socio-demographic and self-rated emotional well-being and job attributes of the respondents. We analyzed data using the analyses of covariance, partial correlations, Cronbach’s alphas, linear regression models and one-sample t-tests were utilized for data analysis. The variables that determine the psychosocial work environment and the quality of life were categorized into four domains.

1. **Physical Health** was determined by
   - a. activities of daily life,
   - b. energy and fatigue,
   - c. burnout,
   - d. pain and discomfort,
   - e. depression,
   - f. sleep and rest
   - g. work capacity.

2. **Psychological health** was determined by
   - a. bodily image and appearance,
   - b. negative feelings,
   - c. positive vibes,
   - d. thinking,
   - e. learning,
   - f. concentration,
   - g. self-esteem,
   - h. beliefs
     - i. spiritual,
     - ii. religious,
     - iii. personal.

3. **Social relationships** were described based on
   - a. personal relationship,
   - b. social support,
   - c. sexual activity

4. **Environment** was determined
   - a. financial resources,
   - b. freedom,
   - c. physical safety and security,
   - d. health and social care accessibility and quality,
   - e. home environment,
   - f. opportunities for acquiring new information and skills,
   - g. participation in and opportunities for recreational
and leisure activities,
 h. physical environment (pollution, noise, traffic, climate)

We used version 21 of SPSS software for data entry and analysis.

**RESULTS**

This study included a total of 100 participants. In the present study, males accounted for 44% of the subjects while females accounted for 56% of the subjects. The unmarried category comprised 27% males and 20% females while 17% of males and 36% of females came under the married category. Applying t-test sampling showed worse working conditions regarding stress, burnout, work-family conflict, social support from superiors, job satisfaction, and self-rated health. Not even a single variable reported better working conditions; which highlights psychosocial factors faced by doctors at work are pretty concerning. Thus, these psychosocial factors resulted in high stress and burnout scores (4.44 and 4.67 respectively). Male and female doctors had the same scores nearly as shown in table 1. The p-value of 0.7 and 0.91 between men and women respectively also showed no difference. The job satisfaction among doctors compared to all other professions score is pretty much near to average score i.e. the standard scores which were taken as a reference which reported less bad condition so doctors are nearly satisfied with their jobs. Work-family conflict was found to be present in both men and women but men showed greater mean score (3.47>2.91) than women which meant that men were found to have more conflicts with their family than women. Both sexes were found to be deprived of social support from senior doctors in our statistical analysis [Table 02]. Doctors reported poor health, both men and women. Stats showed no difference but mean scores reported better health in men than in women [Table 02-4]. Self-rated health and job satisfaction in men are better than women.

**DISCUSSION**

<table>
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<tr>
<th>Variables</th>
<th>Average Scores(Ref)</th>
<th>Mean Scores(Both Men and Women)</th>
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<th>Women</th>
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<tr>
<td>Stress</td>
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<td>4.45</td>
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<td>Satisfaction</td>
<td>2.1</td>
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<td>2.06(close to average)</td>
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<td>Self-rated Health</td>
<td>2.6</td>
<td>2.11</td>
<td>2.27</td>
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<tr>
<td>Burnout</td>
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<td>4.67</td>
<td>4.61</td>
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<tr>
<td>Social Support from superiors</td>
<td>5.6</td>
<td>5.33</td>
<td>5.34</td>
<td>5.32</td>
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<td>Work family conflict</td>
<td>2.1</td>
<td>3.14</td>
<td>3.47</td>
<td>2.91</td>
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Table 2: Comparison between men and women
When a doctor works in a hospital, he/she is exposed to various physical as well as mental risk factors. The environment was found to be one of the major risk factors in a study as well.[1] Our study was based on NRCWE Copenhagen Psychosocial questionnaire comprising of 39 questions. These questions tend to check the reliability of this questionnaire. Various studies at different institutions have been carried out at different times to check the validity and reliability of this questionnaire and its scales.[9, 10] The study conducted by us aimed to determine the levels of various factors in the work environment of doctors. Among many of these variables, one measured by us was stress. Job stress has become one of the main factors reducing efficiency that may, in turn, cause physical and physiological adverse effects on workers. As per research conducted in Iran, the mean job stress was found to be above average i.e 100.34 ± 12.78 in a doctor, compared to 4.44 in our study.[11]

In our study, male and female doctors had nearly the
Table 4: To compare multiple means, simple ANOVA test done from SPSS

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Same scores, though the results were equally concerning, depicting poor work environment conditions. Levels of stress and burnout were almost equal in both genders. A p-value of 0.7 and 0.9 in males and females respectively showed no significant difference in our study. But female workers reported significantly more symptoms of anxiety, depression, post-traumatic stress disorder (PTSD), and emotional exhaustion than males as per other studies carried out in northern Uganda and Scandinavia.[12, 13] Moreover, in another study carried out in Malaysia job stress was reported higher among male medical residents.[14] Burnout values in our studies showed almost uniformity among male (4.61) and female (4.60) doctors. As compared to a study where 11% of subjects met criteria for low burn out, 83% for moderate burnout, and 6% for high burnout.[15] Burnout and stress at the workplace also has to be found in a connection with musculoskeletal disorders.[16, 17] Doctors consider stress as a part of their lives. Job stress is a result of low payment, maltreatment, bullying, and harassment. There is a big interlink between the working environment and stress. Burnout is highly prevalent among clinicians in Surgery according to CBI (Copenhagen Burnout Inventory).[18, 19] The mean of each variable was found and compared with the average values taken from the original Danish employees' study and the results of this survey are used as a reference in the present study.[20, 21] An increase in workload and clinical demands has found to have destructive effects on the clinicians too.[22]
Work/Role overload, lack of support, and overwhelming nature of the disease you are treating are also found to predict variance in stress.\[23\]

Various studies worldwide have proved this as well that stress in the medical community is found to be much raised as compared to people belonging to other professions. And if appropriate self -care, team-care and health-promoting measures are taken, reduced stress levels and burn out was found. Resultant, human performance is optimized to create healthy workplaces.\[24, 25\]

**LIMITATIONS**

The sample size of the study was small i.e 100. The study population comprised of doctors of all age groups from 23 years and onward therefore, could not be restricted to any particular age group. The data was self-reported, hence, there were potential sources of biases (selective memory, attribution, exaggeration).

**CONCLUSION**

The NCRWE psychosocial survey is an appropriate instrument to quantify the psychosocial dynamics in the workplace of healthcare providers. This complete appraisal of the psychosocial working environment aids in tailoring interventions for the precise requirements of various professional groups.

**REFERENCES**


AUTHOR CONTRIBUTIONS
ZBK & AP conceptualize, did data collections, article writing & manuscript submission. AM did data collection & data entry on SPSS. AT did statistical analysis & gave final approval for submission.

ETHICAL CONSIDERATION
This study was approved by the institutional review board of Shaikh Zayed Medical Complex Lahore vide letter number SKZMDC/DPC/399/19 dated 14-12-2019.

HOW TO CITE

CONFICT OF INTERST
The author declared no conflict of interest.

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MANUSCRIPT PROCESSING
Processing:
PJSO-2019-000005-P-27-Nov-2019
PJSO-2019-000005-P-20-Dec-2019
PJSO-2019-000005-C-27-Dec-2019
PJSO-2020-000005-C-31-Mar-2020
PJSO-2020-000005-C-8-Apr-2020

PUBLISHER NOTE
The views and opinion expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any other agency, organization, employer or company.
Effectiveness and safety of endoscopic vs open carpal tunnel release: Single center experience from Maldives

**Original Article**

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4. Medical Student, Lithuanian university of health sciences, Lithuania.

**ABSTRACT**

**Introduction:** Carpal Tunnel Syndrome (CTS) is one of the most frequently encountered entrapment neuropathies. It is prevalent in middle age groups. Conservative management is effective in the majority of population surgery being offered to those who don’t respond to medical therapy.

**Objectives:** To compare the efficacy between endoscopic and open carpal tunnel release procedures for carpal tunnel syndrome patients.

**Design and setting:** Randomized control study in a single neurosurgery department.

**Participants:** Thirty patients aged 35-69 years with clinically diagnosed CTS.

**Main outcome measures:** Primarily – operative duration, bleeding, pain score on day one, the requirement of non-steroidal anti-inflammatory drugs (NSAIDs), time spent in the hospital, and days took to return to work. Other outcomes included infection, wound status/cosmesis, injury to the median nerve, chronic regional pain syndrome, and patient satisfaction.

**Results:** Fifteen patients were allocated to open surgery, and the other 15 for endoscopic. The average operative duration for open surgery was 9.9 minutes compared to 52 minutes spent on the endoscopic procedure. Cauterization had to be performed 4.1 times in endoscopic compared to open. Pain scores rated 3x higher after open surgery and resulted in increased NSAIDs use. Time spent in the hospital after open surgery was 0.7 hours compared to 2.2 in endoscopic, however, patients were able to return to work an average of 10.6 days earlier after endoscopic surgery.

**Conclusion:** In carpal tunnel syndrome, endoscopic surgery allowed patients to experience less post-operative pain and return to work several days sooner than in open surgery.

**Keywords:** Carpal tunnel syndrome, Open carpal tunnel release, endoscopic carpal tunnel release, entrapment neuropathy, median nerve.

**INTRODUCTION**

Carpal tunnel is a bony passageway present in the wrist about an inch wide. The roof of the tunnel is a tough band of connective tissue called transverse carpal ligament and through this tunnel traverses nine flexor tendons and the median nerve.[1] The boundaries of the tunnel are rigid and have little capacity to “stretch”. Carpal Tunnel Syndrome (CTS) is one of the most frequently encountered entrapment neuropathies.[2] It occurs when the tunnel becomes narrowed or when the synovium surrounding the flexor tendons swell putting pressure on the median nerve. This abnormal pressure on the nerve can result in pain, numbness, tingling, and weakness of the hand. The peak age group for CTS is 45-60 years with female predominance and is more common in caucasians and in developed countries.[3]

Carpal tunnel syndrome can be treated conservatively with splinting or steroid injections. Those who fail conservative management are treated surgically via an open or endoscopic approach. Other newer techniques also include ultrasound-guided steroid injection combined with mini scalpel-needle release, nerve hydro-dissection, z-elagion of the transverse carpal ligament and radial extracorporeal shock waves.[1-3]

**MATERIALS AND METHODS**

We conducted this randomized control study to compare the efficacy between ‘endoscopic’ and ‘open’ carpal tunnel release surgeries. The study was performed in a single-center, in the department of Neurosurgery in ADK hospital, Maldives. We analyzed a total sample size of
thirty patients with CTS who underwent surgical decompression of the carpal tunnel.

To make sure our inclusion criteria were specific and purposeful, we paid close attention to their symptoms; we selected the patients, who had classical symptoms of carpal tunnel syndrome, as elaborated by the Katz hand diagram diagnostic criteria.[4] In addition to this, other causes of pain in the forearm, hand, or fingers (abnormalities such as the cervical spine or other hand / upper limb problems) were ruled out. In this way, we established an exclusion criterion, and confirmed CTS as the primary and only causative factor of their symptoms. The patients who had history of trauma to the hands, previous carpal tunnel surgery of either hand or joint diseases were excluded. Informed consent was obtained from every patient. Open surgery was performed in 15 patients, while the other 15 underwent endoscopic surgery. The type of operation for each patient was randomized in accordance with patient preference and availability of the surgeon for a specific time. Both sets of patients were given local anesthesia in the Operation Theater (OT). For the endoscopic surgery, we used a single-portal endoscopic technique at the wrist. The endoscopic incision was a single 2 cm incision at the proximal wrist crease perpendicular to the digits. Comparatively, the incision in the open procedure extended from a point 1.5 cm distal to distal wrist crease in between 3rd and 4th digits up towards the fingers and was 1.5 cm in length. Post-operatively for both procedures, tight dressing was applied to avoid the collection of hematomas. Patients were advised to elevate the hand for 1 day and change the dressing every 3rd day until suture removal in 12 days. Immediate movement of fingers in all ranges was recommended, as well as using the fingers for daily tasks if no pain was felt. No physical therapy was considered; however, paracetamol for 5 days was prescribed.

Both were day surgeries and the outcome was evaluated based on the following indicators: operative duration, bleeding, pain score on day one, the requirement of non-steroidal anti-inflammatory drugs (NSAIDs), infection, wound status/cosmesis, injury to the median nerve, chronic regional pain syndrome, patient satisfaction, time spent in hospital and days taken to return to work.

**RESULTS**

Out of the 30 patients, 24 were female and 6 were male and the age range of them was between 35-69 years. All of the patients admitted to performing heavy work with the hands for a number of years in one form or another; as such, most of the females were traditional workers from villages, however, 2 were...
urban dwellers doing modern household work. All the males had employment in heavy work such as construction, boat driving, and fishing. All of them had undergone conservative medical treatment prior to decompression; 18 females and 4 males had taken only medication, while the rest also incorporated steroid injections into their treatment regime.

The manpower required for the open procedure was only 2, however, for endoscopic was 5. The average operative duration for open surgery was 9.9 minutes compared to 52 minutes spent on the endoscopic procedure[figure 1]. This was mainly due to the slow learning curve for the endoscopic procedure. The operating time for endoscopic procedures decreased as more cases were operated. Note in figure 2, that the operating time for endoscopic procedures decreased from 90 minutes (mins) to 20 mins and the time taken for open surgery remained within the range of 5-15 mins throughout the period.

In regards to bleeding that occurred during the operation, it was observed more times in endoscopic than in open surgery. Hence, from a total of 10 procedures in which cautery was used, 8 were in endoscopic and only twice in open[figure 3].

To evaluate pain, the visual analog scale (VAS) was used. Pain score on Day one of surgery was a mean of 2.7 for open and 0.9 for endoscopic surgery[figure 4]. This also correlated to the results of pain medication used. The only analgesic prescribed was Tablet Paracetamol 500mg thrice daily for 3 days and NSAIDs were given only on an SOS basis. NSAIDs had to be used in a total of 15/30 cases of which 12 were in open surgery and 3 in endoscopic[figure 5].

The time spent in hospital after the open surgery was under one hour and after endoscopic procedure was on an average approximately 2 hours[figure 6].

A follow up was done 30 days post-op to find out the time it took to return to work after surgery. For open surgery it was a mean of 16.1 days and for endoscopic it was 5.5 days[figure 7].

There was no significant difference with regards to wound infection, cosmetic outcome, chronic regional pain syndrome, median nerve injury and patient satisfaction.

**DISCUSSION**

Many of the similar studies complement our results in terms of pain evaluation. Zhang et.al performed statistical analysis among the patients and concluded that scar pain was the lowest (1%) in the endoscopic technique and highest in the standard open carpal tunnel release (OCTR) (7%).[5] They also found that
case, the palmar fascia remains intact, further decreasing the incidence of post-operative pain.[6] Our study describes pain on day 1 of surgery, but it is important to keep in mind that other studies have recorded pain at different periods, for example, Zhang et al. collected the results 2 years post-surgery.[5] There were minor complications in approximately 7% of the cases evaluated by Vasiliadis et al. (i.e. 183 minor complications from 2442 hands). The meta-analysis revealed that ECTR resulted on average in a lower rate of minor complications when compared with OCTR. The summary effect indicates that ECTR is associated with an average relative decrease in odds of minor complications of 50% compared to OCTR. Contrastingly though, further analysis of minor complications revealed that ECTR was associated with a higher rate of transient nerve problems.[4] Another study by Sayegh et al. exclaims that when comparing the complications of open versus endoscopic techniques, there is an increased risk of nerve injury during endoscopic carpal tunnel release.[7] The possible explanation for this is the limited exposure of the carpal ligament before ligation.[8] It is important to highlight that this is a minor complication causing symptoms such as neurapraxia, numbness, paraesthesia and, the reported incidence of serious complications, such as irreversible major injury to the nerve, has been low in ECTR.[4, 6]

In regards to symptom relief and improvement in health-related quality of life, both OCTR and ECTR seem to be equal amounts effective.[9] However, there is a statistically and clinically significant reduction in time out of work or daily activities with ECTR; patients treated with ECTR returned to work or to daily activities on average 10 days earlier than those in the OCTR group.[4]

In the systemic review done by Vasiliadis et al., only 12 ECTR and 12 OCTR cases experienced a major complication (from 1366 ECTR and 1199 OCTR cases treated), however, interestingly the meta-analysis did not reveal any differences between ECTR and OCTR in regards to major complications.[4] In 2006, a study by Benson et al. showed that the incidence of structural damage to nerves, arteries, or tendons, for OCTR is 0.49%, and for ECTR, it is 0.19%.[9] It is important to note that there are two types of endoscopic techniques – single portal and dual portal, and there is a very real possibility that differences in the techniques may alter the results of studies.[5] A third option was explored by Zhang et. al, where the results showed double small incisions combined with the advantages of the standard OCTR and ECTR. The advantages included a minimally invasive procedure, good visualization of the operating field, a less technically challenging procedure, a low wound complication rate, and a good appearance.[5]

In our study, we have evaluated additional factors other than what was discussed above, such as manpower, time taken per surgery as well as the occurrence of bleeding during the surgery. We believe the difference in these factors between the two surgeries is due to the novelty of ECTR, as it requires more training and experience concerning learning to work with the equipment and consequently surgeon comfort. We, of course, had some limitations in our study. One of them being our randomization method – we did not employ a systematic method (for example with sealed envelopes) and it was not double-blinded to remove any bias in terms of surgeon skill, the severity of the CTS case. In our study, we did not measure post-op grip or thenar strength, and we did not measure sensations or pain after the patient was released from the hospital and made no follow-ups. Another limitation is a small sample size and so factors such as “return to work period” could be affected by patient status (for example – their wealth and hence not needing to go back to work urgently, or decreased pain tolerance for open surgery and so couldn’t go back to work as soon).

**CONCLUSION**

In conclusion, our results show that OCTR had lesser operating time with less manpower, less bleeding during surgery, and lesser time spent in the hospital afterward. However, the endoscopic procedures showed that patients had a better pain score, lesser use of NSAIDs, and were able to return to work after the procedure quicker. The results are backed up by multiple other similar studies.[2, 4, 6-7] However, it is important to note that similar comparative studies have also shown that one procedure is not particularly better than the other in terms of safety (i.e. long recovery, major complications, and recurrences).[6, 9]

**REFERENCES**


4. Katz JN, Stirrat CR. A self-administered hand


AUTHOR CONTRIBUTIONS
AN Concept, Design, Literature Search, Final Approval
KN Concept, Design, Literature Search, Submission
AS Data Collection
MSM Statistical Analysis

HOW TO CITE

CONFLICT OF INTEREST
The author declared no conflict of interest

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MANUSCRIPT PROCESSING
Submission: PJSM-2020-000181-O-20-Mar-2020
Processing:
PJSM-2020-000181-P-25-Apr-2020
PJSM-2020-000005-C-29-Apr-2020
PJSM-2020-000181-E-30-Apr-2020
PJSM-2020-000181-P-07-May-2020
Acceptance: 05-May-2020
Publication: 11-May-2020

EDITORIAL TEAM
Lead Editor: S Shams
Asst Editor: J Siddiq, AA Sheikh
Proof: K Zahra
Bibliography: Z Sarfraz

PUBLISHER NOTE
The views and opinion expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any other agency, organization, employer or company.
Bezoar as a cause of gastric perforation in young female patient: A Case Report

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ABSTRACT

Introduction: Bezoars are rare accumulations of indigestible contents within the gastrointestinal tract. These are commonly found in patients with previous psychiatric illness, learning disabilities, and gastric surgery. Computed tomography (CT) is the non-invasive imaging modality of choice as it can not only diagnose but recognize associated complications as well.

Case discussion: We present a case of a young 16 years old female who presented with nausea, dull abdominal pain, and distension. She underwent a Contrast-enhanced CT scan and was diagnosed as a case of gastric bezoar with gastric perforation and frank pneumoperitoneum. The patient underwent exploratory laparotomy and repair of the stomach. Per operative, findings were consistent with trichobezoar. The patient recovered well after surgery.

Discussion: Bezoar is an accumulation of partially digested foreign material in the gastrointestinal (GI) tract. Bezoar can occur in any part of GIT, however, are most common in the stomach. Multiple risk factors are recognized however can occur without the risk factor. Bezoars are classified into several main types. Proper clinical history, examination, and imaging can play an important role in its diagnosis.

Conclusion: Nonspecific abdominal pain in young female patients with a psychiatric disorder can result from uncommon causes such as bezoars and is important for clinicians and radiologists to be aware of this uncommon entity.

Keywords: bezoar, gastric, pneumoperitoneum.

INTRODUCTION

Bezoars are uncommon findings in the gastrointestinal tract and are composed of a wide variety of materials, that are indigestible. Depending upon components different types of bezoars are identified trichobezoar, phytobezoar, pharmacobezoar and lactobezoar. By far phytobezoar and tricobezoar are most common.[1][2] Trichobezoars are most commonly seen in psychiatric patients. When the tail of the trichobezoar extends some distance through the small bowel it is called Rapunzel syndrome.[1][3]

Trichobezoar consists of hair and commonly seen in females who chew and swallow their hair. It is usually confined to the stomach. Phytobezoars consists of poorly digested fruits, inadequate chewing or previous gastric surgery are the predisposing factors and can present with small bowel obstruction.[1]

Seed bezoars are a subtype of phytobezoars, caused by undigested vegetable seeds or fruit pits. Contrary to other types, seed bezoar is found in the rectum with no predisposing factors, a fact that suggests a different pathophysiological process.[3]

Symptoms and management can be variable depending upon the type of bezoar. The presence of bezoar can be indicated from plain radiography however recent studies show that CT scan is more helpful in diagnosing bezoar.[2]

We present a case of a young 16 years old girl who was diagnosed as a case of gastric bezoar on Contrast-enhanced CT (CE CT) abdomen and pelvis.

CASE REPORT

A 16 years old female presented to the diagnostic center of Shaukat Khanum memorial hospital and research center with complaints of nausea, dull abdominal pain, and distension for 48 hours. On examination, the abdomen was tender, bowel sounds were absent. Her mother further gave a history of early satiety and anorexia. The patient's mother told us that she has observed her daughter chewing her hair at times. On workup her CBC, RFTs, and LFTs were within the normal

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range. Previous sonographic reports showed the possibility of left hemi-abdominal mass. Her contrast-enhanced CT examination was performed on a 160 slice canon CT scanner on an emergent basis, which showed frank pneumoperitoneum [Fig 1a]. The stomach was distended with mottled air lucencies suggesting trichobezoar [Fig 1b]. CT was reviewed in multiple planes and gastric perforation with a defect in greater curvature was discovered along with mild abdominal free fluid. The rest of the abdominal organs were unremarkable. After urgent reporting, the informed consent was obtained from mother of child. The patient underwent exploratory laparotomy. Per operative, findings were consistent with trichobezoar and the bezoar was removed along with primary gastric repair with 2/0 vicryl sutures in two layers. Abdomen was lavaged with copious saline and closed in single layer Prolene with insitu 28 fr drain [Fig 2]. The patient recovered well after surgery and discharged on fifth day. She was healthy on follow up visits and was referred for psychiatric counseling.

**DISCUSSION**

The word bezoar can trace its origins to Arabic ("bazahr") and Persian ("pad-zahr"), has been known to human kind for ages.[4, 5] Bezoar was believed to have medicinal properties and was hailed as catholicon.[6] A bezoar is accumulation of partially digested or non-digested foreign material in the gastrointestinal (GI) tract.[3, 5] They can occur anywhere from the esophagus to the rectum, however, they predominate the stomach.[3, 7] Females in any age group are common patients.[7] Trichobezoars are frequently seen in women, with only few cases reported in males and is common among ages of 13–20 years.[8, 9] Certain risk factors identified in adults include gastric surgeries, achlorhydia, chronic illnesses like diabetes (and other endocrinopathies) chronic gastropresis and patients on mechanical ventilation. Trichobezoars are frequent in children, psychiatric patients and mentally retardates.[5] The symptomatology of bezoar varies depending upon its location in gastro-intestinal tract but the most common presentation is with signs and symptoms of intestinal obstruction.[8] On examination, a tender mass may be palpable in abdomen but this is not a definite occurrence.[8, 9]

Investigations include abdominal radiographs which however are of limited use and can only help in diagnosis of bowel obstruction (if present). Sonography is of limited sensitivity in diagnosing gastric bezoar as in our case.[1] Contrast studies of the gastrointestinal tract and computed tomography scan are gold standard. In our patient previous ultrasound raised suspicion of left hemi-abdominal mass however it was inconclusive. CT
scan proved to be the diagnostic modality of choice and revealed trichobezoar causing gastric distension and perforation. Multiple studies have confirmed the role of CT scan in evaluating diagnosing bezoars and also picking up obstruction.[11, 12] CT scan identifies bezoar as, well-defined oval intra-luminal mass with air bubbles, identifies its level of accumulation and presence or absence of GI obstruction. Gastric food particles can at times be confusing to differentiate from bezoar for an inexperienced radiologist. Small bezoars appear as round, floating and of lower density then food residues unlike large bezoars which show internal air locules and tend to fill lumen. Barium studies are indicated, however it may limit endoscopic visualization. Upper GI Endoscopy also remains investigation of choice in long standing cases as it can be used both for diagnostic and therapeutic purposes.[13] GI bezoars are uncommon cause of bowel obstruction and a rarely reported cause of gastric perforation, accounting for only 4% of all admissions for small-bowel obstruction.[14] GI obstruction is more commonly seen in Phytobezoars. Apart from obstruction, prolong history of gastric bezoar can also lead to ulceration and perforation. It is due to pressure necrosis of stomach, weakening the stomach wall and ultimately perforation which is preventable if diagnosed and treated early. Many studies have reported perforation in bezoar only picked up during surgical intervention as in our patient.[15] Hence early diagnosis is imperative for early cure and to prevent complications. It is worthwhile that Ripollés T et al reported that concurrent gastric and intestinal bezoar was found in 53% of their subjects hence whole GI track should be visualized pre and peroperatively.[1]

CONCLUSION
Bezoar should be considered in differential diagnosis in any young female, presenting with pain abdomen, S/S of intestinal obstruction with psychiatric disorders. CT scan is gold standard for early diagnosis and with prompt treatment, many complications can be prevented. These bezoar induced gastric perforations can be managed by primary repair with good results.

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AUTHOR CONTRIBUTIONS
PG: Design, Concepcion, Writing & Submission
ID & NK: Data Acquisition
E-OP

ETICAL CONSIDERATION
Waiver obtained from Institutional Review Board of Shaukat Khanam memorial cancer hospital & research centre on Feb the 28th, 2020. Consent obtained from patient for publication.

HOW TO CITE

CONFLICT OF INTEREST
The author declared no conflict of interest

E-OP

We Value your Opinions. Register your Opinion to this Case Report by Gul P et al. by clicking here.
Coronavirus disease 2019 (COVID-19), a severe acute respiratory syndrome (SARS-CoV 2) originated in the Huanan Seafood market in Wuhan, Hubei Province, Central China. It is also known as the novel coronavirus (2019-nCov).[1] The spread of this epidemic likely originated from bats and pangolin and then infected humans via intermediate hosts such as cats, buffalos, cattle, goats, sheep, and pigeons.[2-4] The Wildlife Conservation Society documented the transmission of COVID-19 from human beings to a four-year-old tiger named Nadia in New York city.[5] COVID-19 cuts through income barriers and has hit the unlikeliest of places and individuals. The wife of Canada’s prime minister has tested positive for the virus.[6] The Italian chief of army staff has tested positive.[7] An adviser to Iran’s supreme leader has died of COVID-19.[8] German Chancellor Angela Merkel has given a stark warning that up to 70 percent of the country’s population could contract the coronavirus.[9] Stock markets around the world have since seen an unprecedented meltdown.[10] The famous philanthropist Bill Gates believes that “no one who lives through pandemic will ever forget it and its impossible to overstate the pain that people are feeling now and will continue to feel for years to come”.[11]

Until its mitigation, it is a time bomb.[12] Hence, like a bomb, this viral bomb can change the landscape of the current world. It may even lay down the foundation for the Industrial Revolution 5.0 (IR5.0). IR5.0 is the “use of sophisticated machinery to make the work of human beings easier and faster”.[13] The first three industrial revolutions began roughly one century after each other. IR 1.0 involved mass-scale mechanization and began in the 1770s.[14] IR 2.0 introduced electrification and began in the 1870s.[15] IR 3.0 spearheaded automation and began in the 1970s.[16] However, IR 4.0, which saw widespread digitization, started in 2001; it was only three decades after IR 3.0 and at the dawn of the third millennium. [17] IR4 is internet technologies and big data.[18] Japanese researchers classify these industrial advancements in a different way. They start with defining Society 1.0 as the hunter-gatherer stage of human development. This is followed by the second agrarian stage (Society 2.0) and third industrial stages (Society 3.0). We are now moving beyond the fourth information age (Society 4.0).[19] In each of these four phases, dehumanization was the major outcome. In contrast to this trend, personalisation is expected to play a major role in IR 5.0 – perhapshumans and machines will dance together, metaphorically.[19] Whether IR 5.0 has already started or not remains controversial. Economic experts believe that with the advent of crypto currencies IR 5.0 has “already” arrived.[20] Bill Gates believes that after Modern Pandemic I, schools will open but large gatherings like filling a stadium with 70,000 people will not be possible. He posits that people will not be able to spend money like before and half of all employment may be online like in Microsoft China. Social distancing, mask and sanitizers may become norms for the future society.[11] Scholars and futurists have already started the discussion on IR 5.0.[21, 22] The current scope contains two visions for IR 5.0 i.e. human-robot co-working and the bio-economy.[21] The main principle of bio-economy is biologization. This is the use and production of complex biological molecules and systems at an industrial scale. [22] Bio-economy along with space adventures (space life, space industries, and space mining) and the increasing penetration of Artificial Intelligence (AI) into everyday life are considered important elements in the
IR5.0.[23, 24] The Japanese introduced Society 5.0, which is based on a high degree of convergence between cyberspace (virtual space) and the physical space (real space). [25] The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals, or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. [26] Whereas, AI is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. Big data is a field that treats ways to analyse, systematically extract information from, or otherwise deal with data sets that are too large or complex to be dealt with by traditional data-processing application software. Finally, Society 5.0 is the Big Data collection by IoT and its conversion through AI to provide comfort in people’s lives. [18, 26] Unlike IR 5.0, the concept of “Society 5.0” (Super Smart Society) is already under discussion. [27] It was conceptualised as a society where advanced IT technologies, IoT, robots, AI, and augmented reality (AR) would be actively used in people’s everyday life, in the industry, health care, and other spheres of activity. [18, 28] The emphasis is not progress, but is placed on the ordinary use of technology for the benefit and convenience of the individual. [28] AI, AR, and 3D printing will be used to convert robots into personalized and customized cobots (collaborative robots). The bio-economy will be driven towards paperless and bank-less market, preferably termed curbot (currency and bank-less systems). Medical microchips have been in use for the purpose of identification, physical access control, contactless retail payment, and even the tracing of kidnapping victims. [29] The authors prefer to label this proposed development as a chipbot (a human with implanted chips) and there are additional sources that verify this reported remedy about implanting human beings with microchips. [30] The internet of things (IoT) has been around for years. The Internet of Bodies (IoB) is an extension of the IoT. [29, 30] IoB basically connects the human body to a network through devices that are ingested, implanted, or connected to the body in some way. [31, 32] Once connected, data can be exchanged, and the body and devices can be remotely monitored and controlled. Another common name for the IoB is embodied computing, where the human body is used as a technology platform. [32] In fact, the number of human beings with chip implants (chipbots) is progressively increasing along with the worldwide COVID-19 has forced the world into a lock down with minimum scientific evidence. [33] Considering the significant impact of COVID 19 on human life, the authors believe that it can be a trigger factor for IR 5.0. Future researchers can define IR5.0 properly but just after a lapse of 20 years (after IR4.0), the new Industrial Revolution 5.0 can emerge to change the world. [13, 16, 18, 21] The Triad of IR 5.0 (consisting of Curbot, Cobot & Chipbot interactions) in a post-COVID era can be responsible for drastic changes in community norms of the world[figure 1]. Research and innovations will open a new era of social distancing (self-isolation, quarantine, lock down, and curfew), personal hygiene, personal protective equipment (PPE), treatment (vaccines, plasma, anti-viral ventilator support, and emergency care), early detection, non-touch techniques (QR-Pay, cryptocurrency, tele-medicine).

IR 4.0 moves towards IR 5.0 when customers have the ability to customize what they want. Simply, it is the cooperation between human beings and machine. IR 5.0 is already showing its emerging trend through the interaction and collaboration between man and machine. [34] 3D printing is being considered as a turning point for
IR. 5.0.[35] With emerging 5G technology, sensors on any device will be able to connect to the internet regardless of Wi-Fi availability – enabling mobile devices 24/7 access to bandwidth. The applications are vast – from smart medical devices, such as pacemakers and insulin pumps that monitor the body and apply the appropriate treatment in real time, to a connected Internet of autonomous vehicles.[36] Industry 4.0 valuates best quantity and mass production whereas Industry 5.0 valuates life standard, creativity and high-quality custom-made products.[36] Industry 5.0 will change the definition of the word “robot”. Robots will no longer be just a programmable machine that can perform repetitive tasks but will transform into an ideal human companion for some scenarios (e.g. spies or bodyguards). Providing robotic productions with the human touch, the next IR will introduce the next generation of robot (cobots) that will already know, or quickly learn, what to do as boss, subordinate, colleagues or security guards. These collaborative robots will be aware of the human presence and will therefore be able to take care of safety and risk criteria. Industry 5.0 will bring unprecedented challenges in the field of Human–Machine Interaction (HMI) as it will put machines very close to the everyday life of a person.[36] The authors believe that when robot will be replaced by cobots and by augmented AI, human minds will be controlled by super-minds (preferably super masters) through nanotechnology used to convert human beings into homebots/chipbots. This synergism of cobot, chipbot, and curbot will result in the real IR. 5.0.[figure 2]

The actualization of IR5.0 will encompass a wide range of domains and applications. The chipbot will be the hypothetical human that will result after COVID-19 through implantable nanotechnology chips. This will be enabled by mass vaccination using assisted hidden technology in vials. The crypto currency robots (curbots) will be technology assisted mobile banking robots that replace or complement the real physical currency or banks. This will lay the foundation of the cashless market. The need to open tele-medicine centres in developing countries after pandemics will be self-explanatory. Terminologies in tele-medicine will change as predicted and virtual specialist hospital based on remote presence will develop more rapidly. They will be a new source of hope for patients and physicians as they will allow adherence to strict social distancing guidelines and access to expert opinions and treatments.[36-38] Tele-cardiology and other highly specialized applications are already progressing (even in developing countries) and will significantly reduce morbidity and mortality by their introduction in rural settings.[39] The physical interaction between the young and the elderly will be discouraged initially but will later become a societal norm. Drones will be used to link hospitals and hostile humans. Roboscope (non-interventional robots) will be replaced by Roboop (interventional robots).[39]

Once human beings have been conquered, the race to conquer space will start. This will initiate the new era of IR6.0 within next ten years. Like the earlier industrial revolutions, IR6.0 will likely neglect human beings and perhaps result in some unrest. Fortunately, there is ample time to ensure that the contributions of IR 5.0 can minimize or subvert the negative externalities of IR6.0.

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Who would have thought on the sunset of 2019 what 2020 was bringing on!
From the day COVID-19 originated it has sent shock waves across the globe irrespective of the religion, race, gender and power. From the outbreak in Wuhan, it has crossed all borders and has spread at varying speed across the globe. The preparations for it by all the countries have left a big question mark.

**TIMELINE**
A brief timeline of the events since the origin is as follows:[2, 3]

- **01 Dec 2019** 📅 **Index patient** of coronavirus in China became symptomatic.[4]
- **31 Dec 2019** 📅 China informed WHO of a pneumonia of unknown aetiology found in the city of Wuhan in the Hubei province.
- **01 Jan 2020** 📅 Wuhan seafood market, thought to be the source of outbreak, closed.
- **03 Jan 2020** 📅 China reported 44 patients with pneumonia of unknown aetiology.
- **05 Jan 2020** 📅 WHO published its first risk assessment and advice: “Continue surveillance of influenza and severe acute respiratory illness, no specific measures for travelers”.
- **07 Jan 2020** 📅 A new type of virus, called **novel coronavirus** is identified by Chinese researchers.
- **10 Jan 2020** 📅 WHO issued its first **guidance** on the novel coronavirus with reference to other coronaviruses such as Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS).
- **11 Jan 2020** 📅 China reported its first death due to the novel coronavirus. Patient was 61 years old who passed away on 9th Jan 2020.
- **12 Jan 2020** 📅 China shares the **genetic sequence** of the novel coronavirus.
- **13 Jan 2020** 📅 First case of novel coronavirus reported outside China in **Thailand**.
- **15 Jan 2020** 📅 China reports second **death**.
- **16 Jan 2020** 📅 Japan reports its first coronavirus case.
- **18 Jan 2020** 📅 China reports third death.
- **19 Jan 2020** 📅 **First confirmed cases reported outside of Wuhan**.
- **20 Jan 2020** 📅 First case in **South Korea** and **United States** (U.S.). Human to human transmission of virus confirmed.
- **21 Jan 2020** 📅 WHO makes **field visit** to Wuhan.
  - **Taiwan** reported its first case of Coronavirus.
  - Global cases reach 222.
- **22 Jan 2020** 📅 **Hong Kong** and **Macau** report their first cases.
- **23 Jan 2020** 📅 City of **Wuhan** goes into lock down.
  - **Singapore** and **Vietnam** report their first Coronavirus cases.
WHO issues guidance on mass gathering and taking care of ill travelers.

Iran reports its first case and first deaths.

South Korea reports its first COVID-19 death.

Italy outbreak begins.
Israel and Lebanon report their first COVID-19 cases.
WHO warns that the window of opportunity is “narrowing”.
Italy closes Venice Carnival to limit spread of coronavirus.

First case in Afghanistan, Bahrain, Iraq, Kuwait and Oman.

First case in Algeria, Austria, Brazil, Croatia, and Switzerland.
Iran's deputy health minister confirms he has coronavirus.

First case in Georgia, Greece, North Macedonia, Norway, Pakistan and Romania.
First time since the outbreak began, there are more reported cases outside China in a single day 459, than in China, 412.

3474 cases of COVID-19 outside China in 44 countries.
First case in Denmark, Estonia, San Marino and Netherland.
28 Feb 2020  
WHO raises the global risk of spread of COVID-19 from “high” to “very high”.  
First case in Azerbaijan, Belarus, Iceland, Lithuania, Mexico, Monaco, New Zealand and Wales.

29 Feb 2020  
USA reports first American death on American soil.  
First case in Ecuador, Ireland, Luxembourg and Qatar.

01 Mar 2020  
First case in Armenia, Czechia, Dominican Republic, Saint Barthélemy and Saint Martin.  
Global deaths surpass 3000.  
South Korea with 3736 and Italy with 1128 cases have the most cases outside China.  
First case in Andorra, Indonesia, Jordan, Latvia, Morocco, Portugal, Saudi Arabia, Senegal and Tunisia.

02 Mar 2020  
First case in Argentina, Chile, Gibraltar, Liechtenstein and Ukraine.

04 Mar 2020  
Saudi Arabia suspended Umrah pilgrimage.  
First case in Faroe Islands, Hungary, Poland and Slovenia

05 Mar 2020  
First case in Bosnia and Herzegovina, Martinique, Palestine and South Africa.

06 Mar 2020  
WHO publishes draft R & D blueprint for COVID-19.  
First case in Bhutan, Cameroon, Colombia, Costa Rica, Peru, Serbia, Slovakia, Togo and Vatican City.

07 Mar 2020  
First case in Maldives, Malta, Moldova and Paraguay.  
Global cases surpass 100,000.

08 Mar 2020  
Saudi authorities lock down eastern Qatif.  
COVID-19 in over 100 countries reported.  
First case in Albania, Bangladesh and Bulgaria.

09 Mar 2020  
Italy places all 60 million residents on lock down.  
Global deaths surpass 4000.  
First case in Brunei, Cyprus, Guernsey and Panama.

10 Mar 2020  
Lebanon and Morocco report their first death.  
First case in Bolivia, Burkina Faso, DR Congo, Jamaica, Jersey, Mongolia, Northern Cyprus and Turkey.

11 Mar 2020  
“WHO declares COVID-19 as a pandemic”.  
First case in Cuba, French Polynesia, Honduras, Ivory Coast and Réunion.  
U.S. bans all travel from 26 European countries.

12 Mar 2020  
First case in Saint Vincent and the Grenadines and Trinidad and Tobago.

13 Mar 2020  
WHO declares Europe as the epicentre of the pandemic.  
Global deaths surpass 5000.  
A U.S. national emergency is declared over the outbreak.  
First case in Antigua and Barbuda, Aruba, Cayman Islands, Curacao, Ethiopia, Gabon, Ghana, Guadeloupe, Guatemala, Guinea, Kazakhstan, Kenya, Kosovo, Puerto Rico, Saint Lucia, Sudan, Suriname, US Virgin Islands, Uruguay and Venezuela.

14 Mar 2020  
Nationwide lock down started in Spain.  
First case in Central African Republic, Congo, Equatorial Guinea, Eswatini, Mauritania, Mayotte, Namibia, Rwanda and Seychelles.

15 Mar 2020  
First case in Akrotiri and Dhekelia, Bahamas, Guam and Uzbekistan.

16 Mar 2020  
First case in Benin, Greenland, Liberia, Somalia and Tanzania.  
For the first time since the outbreak, infections and deaths outside China surpass those within China.

17 Mar 2020  
First case in Barbados, Gambia, Montenegro, and Sint Maarten.
18 Mar 2020 | **Chile** and **Guatemala** shut down their borders. 
First case in **Bermuda, Djibouti, El Salvador, Kyrgyzstan, Mauritius, Montserrat, New Caledonia, Nicaragua** and **Zambia**.

19 Mar 2020 | **Global cases surpass 200,000** with over 10,000 deaths. 
It took nine weeks to reach 100,000 cases and just 12 days to reach 200,000. 
For the first time since the outbreak began, Wuhan reported no new cases. 
First case reported in **Angola, Chad, Fiji, Haiti, Isle of Man** and **Niger**.

20 Mar 2020 | First case in **Cape Verde, East Timor, Madagascar, Papua New Guinea, Uganda** and **Zimbabwe**.

21 Mar 2020 | First case in **Åland Islands, Eritrea** and **Transnistria**.

22 Mar 2020 | **Germany** under partial lock down. 
Global cases surpass 300,000. 
It took nine weeks to reach 100,000 cases, 12 days to reach 200,000 and 3 days to reach 300,000. 
First case in **Dominica, Grenada, Mozambique** and **Syria**.

23 Mar 2020 | **Britain** under lock down. 
Global deaths surpass 15,000. 
First Case in **Belize, Myanmar** and **Turks and Caicos Islands**. 
First Pakistani Doctor (Dr **Usama Riaz**) embraces martyrdom.

24 Mar 2020 | **Global cases surpass 400,000**. 
It took nine weeks to reach 100,000 cases, 12 days to reach 200,000, 3 days to reach 300,000 and 2 days to reach 400,000. 
First case in **Laos** and **Libya**.

25 Mar 2020 | **New Zealand** under lock down. 
Global deaths surpass 20,000. 
First case in **British Virgin Islands, Guinea-Bissau, Mali** and **Saint Kitts and Nevis**.

26 Mar 2020 | **Global cases surpass 500,000**. 
Total confirmed cases in the U.S reach 82,404 – the highest in the world – surpassing China's 81,782 and Italy's 80,589. 
First case in **Anguilla**.

27 Mar 2020 | Dr **Usama Riaz** (Pakistan) awarded **Nishan i Kashmir** post humously. 
Global deaths surpass 25,000.

28 Mar 2020 | **Global cases surpass 600,000**. 
It took 9 weeks to reach 100,000 and it increased 6 times in 3 weeks. 
Spain (832) and Italy (889) hit new record for the number of deaths in one day.

29 Mar 2020 | **Global cases surpass 700,000**. 
Global deaths surpass 30,000. 
First case in **Northern Mariana Islands**.

30 Mar 2020 | **Global deaths surpass 35,000**. 
First case in **Botswana**.

31 Mar 2020 | More than 1/3 of humanity under some form of lock down. 
Global cases surpass 800,000. 
Global deaths surpass 40,000. 
First case in **Burundi, Sierra Leone, Sint Eustatius** and **Somaliland**.

01 Apr 2020 | **Global cases surpass 900,000**. 
Global deaths surpass 45,000.

02 Apr 2020 | **Global cases surpass 1 million**. 
Global deaths surpass 50,000. 
**Malawi** report first case.
As we look back on the spread of this pandemic, countries that were proactive in taking strict social distancing like Singapore and South Korea, managed to control the pandemic appropriately while the countries which delayed in acting like US and Italy their figures of mortality are disastrous. While most of the countries now are in some sort of lockdown, these strict measures may well in be place over the coming several months or perhaps even a year. These social distancing measures have made people retreat in their homes, business to shut down, global economic crisis and exacerbation of the health of the vulnerable group of people. So, what's next?

**FLATTENING THE CURVE**

Health authorities around the globe are talking about “flattening the curve” meaning to reduce the rate at which new infection arise in order to avoid the overburden on the healthcare system and preventing it to collapse. That's the reason lock down and social distancing have been implemented.

**IMMUNITY TO COVID-19**

Lots of talk going around so called “herd immunity” which means that when enough of the global population becomes acquire the immune response to virus, further progression can be dampened. There are two possible pathways, neither of them is proven for COVID-19. First is the individual gets infected and acquires the immune response and second is by getting vaccinated without getting sick. A number of trials and attempts at vaccine
development are ongoing around the world.[3, 4]

**MASS TESTING**

Given the economic burden of the disease all countries do not have the resources to do mass testing. The theory behind it is that without knowing the actual burden of the disease (those that get infected whether symptomatic or asymptomatic) scientist cannot draw conclusions and identify population at risk.

**CONCLUSION**

COVID-19 pandemic is not a sprint rather it is a marathon with destination not visible at this particular moment and time. Collective efforts and resilience of millions of people is the need for the hour. Lockdowns and strict social distancing cannot be sustained forever but timing is the key to it, as letting up too soon may worsen the situation further.

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**HOW TO CITE**


**CONFLICT OF INTEREST**

The author declared no conflict of interest

**E-OP**

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**MANUSCRIPT PROCESSING**

Submission: PJSM-2020-173-O-09-Apr-2020

Acceptance: 09-May-2020

Publication: 11-May-2020

**EDITORIAL TEAM**

Lead Editor: A Anwer

Associate Editor: Z Sarfraz

Proof: K Zahra

Bibliography: Z Sarfraz

**PUBLISHER NOTE**

The views and opinion expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any other agency, organization, employer or company.