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Examining the Effects of COVID-19 Pandemic on ST Segment-elevation Myocardial Infarction Treatment Strategies with the Impact of Event Scale

COVID-19 Pandemisinin ST Segment Yükselmeli Miyokard Enfarktüsü Tedavi Stratejilerine Etkisinin Olay Skalası Etkisiyle İncelenmesi

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Abstract

Objective: Primary percutaneous coronary intervention (PPCI) is the first-line recommended therapy for acute ST-segment-elevation myocardial infarction (STEMI). While some papers have suggested to continue performing PPCI for patients with STEMI, some papers highlighted using lytic therapy during the earlier pandemic period. The points underestimated in these publications were the psychological impact of the coronavirus disease-2019 (COVID-19) pandemic on cardiologists and their STEMI treatment strategies. Based on this idea, we searched an answer to this question. This document evaluated STEMI treatment strategies using the Impact of Event Scale (IES) during the early stages of the COVID-19 pandemic.

Methods: An online, questionnaire study conducted randomly to 1000 cardiologists via e-mail or WhatsApp message to evaluate cardiologists' STEMI treatment strategies with five psychological factors [daily moods (F1), willingness and ability to work (F2), anxiety about infection (F3), lack of medical information (F4), and feeling of being protected (F5)] which were filled between 01-15 May 2020 by 136 volunteers in Turkey.

Results: Turkish invasive cardiologists major treatment choice for patients with STEMI were PPCI during the early pandemic period, even they felt worse all in all, less willingness to work, and higher anxiety about infection, which means higher total IES, F1, F2, and F3 scores in the study. Different psychological impacts of COVID-19 pneumonia had different effects on cardiologists' treatment strategies. The F3 score was the major determinant psychological factor for the STEMI treatment strategy. The participants with the highest F3 scores [10.0 (9.0-11.0)] preferred thrombolytic therapy.

Conclusion: This unique study evaluating cardiologists real-life STEMI treatment strategies using the IES during the COVID-19 pandemic showed that lytic therapy came to the fore again for the cardiologists with the highest anxiety level about COVID-19 pneumonia in real-life.

Keywords: Acute ST-segment-elevation myocardial infarction, the psychological impact, COVID-19 pandemic, treatment strategies

Öz

Amaç: Primer perkütan koroner girişim (PPCI), akut ST-segment-yükselmeli miyokard enfarktüsü (STEMI) hastaları için önerilen ilk basamak tedavidir. Pandeminin erken dönemlerinde yayınlanan bazı makaleler STEMI hastaları için PPCI tedavisi ile devam etmeyi önerirken, bazı makaleler litik tedavisinin raflardan indirilerek tekrar kullanılmasının altını çizmiştir. Bu yayınlarda gözden kaçırılan nokta; koronavirüs hastalığı-2019 (COVID-19) pandemisinin



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Öz

kardiyologlar üzerindeki psikolojik etkilerinin STEMI tedavi stratejileri üzerine etkileriydi. Bu fikirden yola çıkarak çalışmada COVID-19 pandemisinin erken dönemlerinde kardiyologların STEMI tedavi stratejilerinin Olay Ölçeğinin Etkisi (IES) ile değerlendirilmesi amaçlandı.

Yöntem: Dijital çalışma anketleri 01-15 Mayıs 2020 tarihleri arasında e-posta veya WhatsApp mesajı yoluyla Türkiye’de çalışan rastgele 1000 kardiyoloğa gönderilmiştir. Anketlerde kardiyologların STEMI tedavi stratejileri ile beş psikolojik faktör [günlük ruh hali (F1), çalışma isteği ve yeteneği (F2), enfeksiyon kaygısı (F3), tıbbi bilgi eksikliği (F4), ve korunma hissi (F5)] ilişkisi değerlendirilmiştir. Gönüllülük esasına dayanan çalışmada anketler 136 kardiyolog tarafından doldurulmuştur.

Bulgular: Pandeminin erken dönemlerinde Türk invaziv kardiyologlar kendilerini genel olarak daha kötü hissettikleri, daha az çalışma istekleri ve daha fazla enfeksiyon kaygıları (daha yüksek toplam IES, F1, F2 ve F3 puanı) olduğu dönemde de STEMI hastaları için ana tedavi seçenekleri yine PPCI idi. COVID-19 pnömonisinin farklı psikolojik etkilerinin kardiyologların tedavi stratejileri üzerinde farklı etkilere sahipti. F3 puanı STEMI tedavi stratejisinde belirleyici ana psikolojik faktördü. Trombolitik tedaviyi tercih edenler F3 puanı en yüksek olan katılımcılardı [10,0 (9,0-11,0)].

Sonuç: COVID-19 pandemisi sırasında kardiyologların STEMI tedavi stratejilerinin IES ile değerlendirildiği bu özgün çalışmada gerçek hayatta COVID-19 pnömonisi ile ilgili kaygı düzeyi en yüksek olan kardiyologlar için STEMI hastalarında tedavi seçeneği olarak litik tedavinin yeniden gündeme geldiğini göstermiştir.

Anahtar Kelimeler: Akut ST-segment-yükselmeli miyokard enfarktüsü, psikolojik etki, COVID-19 pandemisi, tedavi stratejileri

Introduction

Primary percutaneous coronary intervention (PPCI) is the first-line recommended therapy for acute ST-segment-elevation myocardial infarction (STEMI) since many years^(1,2). During the earlier period of the coronavirus disease-2019 (COVID-19) pandemic, the Turkish Cardiology Association published a consensus report that stated that fibrinolysis can be considered an option for stable patients with STEMI with active COVID-19 during the pandemic⁽³⁾. In these days another report from China outlined reliance on fibrinolytic therapy, in the absence of contraindication⁽⁴⁾. Thrombolytic therapy was recommended for patients with STEMI with suspected/confirmed or even excluded COVID-19 pneumonia during the pandemic if symptom onset time was <12 hours⁽⁴⁾. On the other hand, especially in the United States, PPCI remained the standard of care for patients with STEMI at PCI-capable hospitals when it can be provided in a timely fashion, with an expert team outfitted with personal protective equipment in a dedicated cardiac catheterization laboratory (CCL) room during the COVID-19 pandemic^(5,6). These recommendations were based on each regional system’s PCI Center, STEMI referral hospitals, and emergency medical system. However, another important point that was excluded in those recommendations were the psychological effects of the pandemic that shook the world poses a serious threat to invasive cardiologists who perform interventional procedures together with their staff. The first COVID-19 infection case was reported on March 11, 2020 in Turkey. Since then, every day media reported the number of infected patients in all countrys and has triggered spontaneous and intensive media attention, which has affected people's mental

health. The association between exposure to COVID-19-specific information and severe mental health (depression, anxiety, insomnia) was documented in public health studies during the initial COVID-19 outbreak^(7,8). A new virus pandemic with lots of unknown about transmission, self-protection, and curative therapy during the initial periods also plunged the cardiologists in the country into confusion and anxiety as the other people in worldwide. Based on these subjects in our study, we analyzed the psychological impact (daily moods, willingness and ability to work, anxiety about infection, lack of medical information and feeling of being protected) of the COVID-19 pandemic on Turkish invasive cardiologists and changes in their STEMI treatment strategies and coronary revascularization approaches in PPCI under these psychological impacts during the early pandemic period.

Materials and Methods

Subjects

We used an online survey method. This online, questionnaire study conducted randomly to 1000 Turkish cardiologists (either invasive or non-invasive cardiolgists) via e-mail or WhatsApp message. Participation in the survey was based on voluntariness and participation to the study was expected to be between 10-15%. Online, self-administered, anonymous questionnaires were filled by 136 cardiologists starting on 01 May 2020, which was approximately the peak of the COVID-19 outbreak in Turkey and ended on 15 May 2020.

Content of the Questionnaire

The questionnaire explained the purpose of the study and stated that the results will be published, and respondents will remain anonymous. The questionnaire consisted of four different sections.

1. Socio-demographic characteristics of the participants.
2. Daily clinic working conditions before (regular time) and during the pandemic: CCL properties.

3. STEMI treatment strategies and changes in therapeutic approaches during the pandemic.

4. Stress-related questions associated with the COVID-19 pneumonia and the Impact of Event Scale (IES).

The fourth section of the questionnaire consisted of 18 items and is shown in Table 1^(9,10). IES was developed as a measure of psychological stress reactions after trauma⁽¹¹⁾ and has been widely used over 20 years. Because the IES was found

Table 1. Factor analysis of the 18 stress-related questions

| Questions | Factors | | | | | |
|---|-----------------------|-----------------------|----------------------|----------------------|-------------|----------------|
| | F1 | F2 | F3 | F4 | F5 | h ² |
| Factor 1. Daily moods (Cronbach $\alpha=0.897$) | | | | | | |
| Q10 Physical exhaustion | 0.87 | 0.17 | 0.09 | 0.14 | -0.09 | 0.17 |
| Q11 Mental exhaustion | 0.83 | 0.13 | 0.09 | 0.21 | 0.02 | 0.24 |
| Q12 Insomnia | 0.81 | 0.02 | 0.03 | 0.02 | -0.06 | 0.35 |
| Q15 Burden of increased quantity of work | 0.79 | 0.09 | 0.10 | 0.07 | 0.09 | 0.34 |
| Q16 Burnout from changes in daily functioning | 0.78 | 0.11 | 0.10 | 0.10 | 0.13 | 0.34 |
| Q14 Feeling of being isolated | 0.72 | 0.24 | 0.04 | 0.12 | 0.09 | 0.39 |
| Q13 Elevated mood | 0.56 | -0.02 | 0.14 | 0.02 | -0.10 | 0.65 |
| Factor 2. Willingness and ability to work (Cronbach $\alpha=0.844$) | | | | | | |
| Q8 Hesitation to work | 0.40 | 0.76 | 0.26 | 0.06 | -0.02 | 0.20 |
| Q9 Feeling of having no choice but to work due to obligation | 0.45 | 0.73 | 0.09 | 0.09 | 0.04 | 0.25 |
| Q7 Anxiety about compensation | 0.29 | 0.70 | 0.20 | 0.08 | -0.16 | 0.35 |
| Q6 Lack of material in protection from infection | 0.30 | 0.58 | 0.14 | 0.46 | -0.18 | 0.31 |
| Factor 3. Anxiety about infection (Cronbach $\alpha=0.822$) | | | | | | |
| Q2 Anxiety about infecting family | 0.17 | 0.16 | 0.85 | 0.10 | 0.01 | 0.21 |
| Q1 Anxiety about being infected | 0.18 | 0.09 | 0.83 | 0.22 | 0.05 | 0.21 |
| Q3 Anxiety of being infected during commuting | 0.27 | 0.26 | 0.71 | 0.16 | 0.02 | 0.34 |
| Factor 4. Lack of medical information (Cronbach $\alpha=0.913$) | | | | | | |
| Q4. Lack of knowledge about infectivity and virulence | 0.23 | 0.10 | 0.17 | 0.89 | 0.03 | 0.11 |
| Q5 Lack of knowledge about prevention and protection from infection | 0.31 | 0.07 | 0.16 | 0.88 | -0.06 | 0.09 |
| Factor 5. Feeling of being protected (Cronbach $\alpha=0.781$) | | | | | | |
| Q17 Feeling of being protected by national and local governments | 0.04 | -0.12 | 0.11 | 0.06 | 0.90 | 0.16 |
| Q18 Feeling of being protected by hospital | 0.01 | 0.01 | -0.05 | -0.11 | 0.89 | 0.19 |
| Eigenvalue | 6.99 | 1.96 | 1.78 | 1.33 | 1.02 | - |
| Variance explained (%) | - | - | - | - | 72.07 | - |
| Between factor correlation | - | - | - | - | - | - |
| F2 | -6.49E ⁻¹⁶ | - | - | - | - | - |
| F3 | -1.96E ⁻¹⁵ | 1.73E ⁻¹⁶ | - | - | - | - |
| F4 | -8.31E ⁻¹⁶ | -2.39E ⁻¹⁶ | 9.56E ⁻¹⁶ | - | - | - |
| F5 | -2.01E ⁻¹⁵ | 9.75E ⁻¹⁶ | 2.95E ⁻¹⁶ | 1.26E ⁻¹⁵ | - | - |

Bold, factor loading ≥ 0.50

to be useful for evaluating nurses' anxiety about becoming infected with SARS⁽¹²⁾, we believed it would be effective for determining the psychological impact of the COVID-19 pandemic on invasive cardiologists, the health-care workers exposed to highly contagious, life-threatening disease. The respondents used a 5-point Likert scale (0: never; 1: rarely; 2: sometimes; 3: usually; 4: always) to describe how often they experienced the 18 items during the pandemic. The sum of all scores was taken to indicate the severity of the psychological reactions to stress. Exploratory factor analysis to the 18 stress-related questions was applied. Cronbach alpha values were calculated by subtracting each scale question. The highest Cronbach alpha value was determined by the inclusion of all questions, and none of the questions dropped out. The Cronbach alpha coefficient of the five factors and the total IES score was $\alpha_{F1}=0.897$; $\alpha_{F2}=0.84$; $\alpha_{F3}=0.822$; $\alpha_{F4}=0.913$; $\alpha_{F5}=0.781$, $\alpha_{Ftotal}=0.891$ respectively and indicating good internal consistency and acceptable reliability.

The study was approved by the University of Health Sciences Turkey, İzmir Tepecik Education and Research Hospital Ethics Committee (decision no: 2020/8-1, date: 08.07.2020).

Statistical Analysis

Descriptive statistics are given in median (Q1-Q3) and frequency tables in n (%). Checking the normal distribution was analyzed with the Shapiro Wilk test. Cronbach's alpha coefficients were used as an estimate of the reliability of the IES. To determine the IES factors, varimax rotated principal component analysis was used for exploratory factor analysis. Factor numbers were determined using the scree test and at least 10% explained variance. Items with loadings ≥ 0.50 were entered into the factor. Pearson product-moment correlations were calculated to describe the factor relationships. The analysis of the data was done using the R Studio (RStudio: Integrated Development for R. RStudio, Inc., Boston, MA.) package program. As statistical significance level, $p < 0.05$ was considered significant.

Results

The study composite of 136 invasive cardiologists and 113 (83.0%) participants were men. Cardiologists between 30-49 years old were 77.0% (n=104) of the participants and 105 (78.0%) participants were working on cardiology over ten years. Majority of the participants were working in university hospitals (38.0%, n=51, followed by cardiologists working in Research and Training hospitals (n=40, 29.0%). There were 103 (75.7%) participants working in a hospital with

>1 catheterization laboratory and 67 (55.4%) participants were working in a hospital set aside a catheterization laboratory for patients with COVID-19 pneumonia during the pandemic.

The study results showed that majority of the participants' (n=119, 88.8%) treatment choice for the patients with STEMI whether the patient COVID-19 positive or not, was a PPCI during the earlier pandemic period. Gender difference had no effect on this treatment choice ($p=0.422$). These participants had statistically significantly higher total IES [30.50 (22.50-37.25); $p=0.012$], F1 [10.00 (5.00-14.50); $p=0.020$], F2 [7.00 (4.50-9.00), $p=0.043$], and F3 [9.00 (6.50-10.00); $p=0.015$] scores (Graphic 1a), which means feeling worse all in all, worse daily moods, less willingness and ability to work, and higher anxiety about infection in the study. It is shown that the pandemic changed most cardiologists' (58.3%, n=81) culprit lesion treatment strategy during PPCI. Using simpler and shorter techniques in PPCI (n=50, 35.9%) was the major change in the study (Graphic 1b). The F3 score was the major determinant stress factor in deciding patients with STEMI' treatment strategy. When F3 scores were compared in the subgroup analysis, the participants who preferred thrombolytic therapy had the highest F3 scores [10.0(9.0-11.0)] in the study.

Total IES Score: The participants with higher IES scores were the cardiologists who were working in university hospitals [n=51, 29.00 (19.50-35.50) [median (Q1-Q3); $p=0.009$], had obesity as a risk factor for COVID-19 pneumonia (n=9, 25.00 (18.00-32.00); $p=0.036$) and the participants who lived apart from their families during that period [n=40, 27.50 (19.75-39.00); $p=0.049$]. The cardiologists with higher total IES scores showed a significant change in their therapeutic approaches to lesions during PPCI since the pandemic [n=78, 26.50 (21.00-34.00); $p=0.002$]. The change was in the therapeutic approach of STEMI patients with multi-vessel disease, as shown in Graphic 1b and Graphic 1c.

Factor 1; "Daily Moods": Cardiologists who preferred PPCI treatment strategy whether the STEMI patient COVID-19 positive or not had a statistically significantly higher F1 score [n=108, 10.00 (5.00-14.50); $p=0.020$]. These participants with higher F1 scores had a significant change in their therapeutic approaches to lesions during PPCI [n=78, 8.00 (4.00-13.00); $p=0.011$]. The change was in the therapeutic approach of STEMI patients with multi-vessel disease as shown in Graphic 1b and Graphic 1c. There were 40 (29.4%) participants made themselves apart from their family during the pandemic and

they had significantly higher F1 score (10.000 (4.000-15.000); p=0.026 in the study.

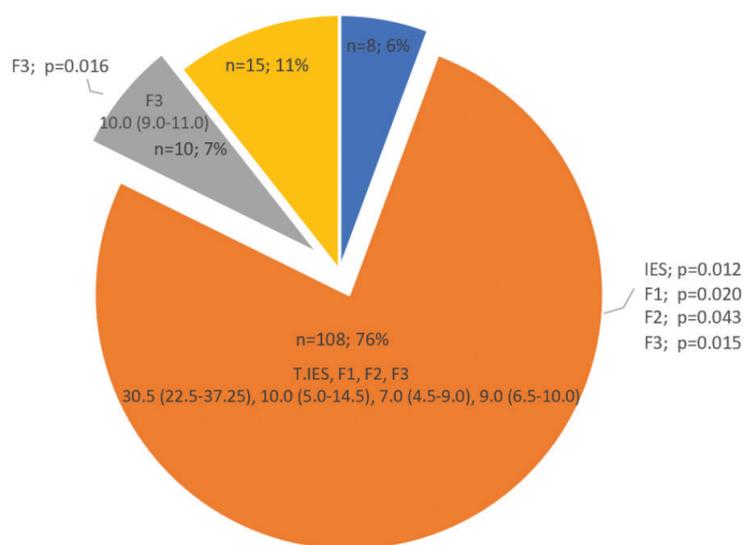
Factor 2; "Willingness and Ability to Work": The participants who were working in private hospitals [n=28, 7.00 (4.00-9.25); p=0.004], working in a hospital set aside a catheterization laboratory for patients with COVID-19 pneumonia [n= 67, 6.00 (4.00-9.00); p=0.037] and working in require at nights [n=53, 7.00 (4.00-9.25); p=<0.001] had significantly higher F2 scores in the study.

Factor 3; "Anxiety About Infection": The study results showed that cardiologists with higher F3 scores ordered a test (rapid COVID-19 test and/or Thorax CT) in the emergency room for the diagnosis of COVID-19 pneumonia even the patient with STEMI symptomatic or not for COVID-19 pneumonia (Graphic 1a). It is shown that participants with the highest F3 scores preferred thrombolytic therapy for COVID-19-positive patients with STEMI (Graphic 1a). There was a statistically significant change in the PPCI technique on culprit lesions among the participants with higher F3

scores who performed PPCI in patients with STEMI during the earlier pandemic period [n=78, 8.00 (6.00-9.75); p=0.002]. Preferring simpler and shorter techniques during PPCI were the significant changes in this group (Graphic 1b). When F3 scores were compared; F3 scores of the participants who preferred thrombolytic therapy [10.0 (9.0-11.0)] for patients with STEMI was significantly higher than the F3 scores of participants who changed their culprit lesion treatment strategy as using more simple and shorter techniques during PPCI [8.0 (6.0-9.75)] (p=0.042) in the study. It is also shown that the cardiologists who were working in university hospitals [n=51, 8.00 (6.00-9.75); p=0.033] had significantly higher F3 scores.

Factor 4; "Lack of Medical Information": In our stud, 15 (11.0%) participants declared that some days they used additional vitamin-mineral supplements and 34 (25.0%) participants declared that every day they used additional vitamin-mineral supplements during the early period of the pandemic, even they did not use it before. These participants had significantly higher F4 scores (p=0.015). The

What is your treatment choice in STEMI patients during COVID-19 Pandemic?



- Regardless of whether the patient Covid-19 positive or negative, in case of no contraindication I give thrombolytic therapy and follow the patient.
- Regardless of whether the patient Covid-19 positive or negative, I take the patient into the cardiac catheterization laboratory for primary PCI.
- First I expect the Covid-19 test to be completed. If Covid-19 test is positive, I give thrombolytic therapy to the patient and follow the patient medically.
- First I expect the Covid-19 test to be completed. If Covid-19 test is negative, I take the patient into the cardiac catheterization laboratory for primary PCI.

Graphic 1a. What is your treatment choice in STEMI patients during COVID-19 Pandemic?

IES: Impact of Event Scale, F1: Daily Moods, F2: Willingness and ability to work, F3: Anxiety about infection, n: number of participants, COVID-19: Coronavirus disease-2019, STEMI: ST-segment-elevation myocardial infarction

cardiologists working in their own clinics had a significantly higher F4 score, but there was only one participant who worked in the own clinic in the study. The data based on one participant, has been ignored in the study. When one participant was ignored, cardiologists working in university hospitals had significantly higher F4 scores [n=51, 3.00 (1.50-4.00); p=0.033].

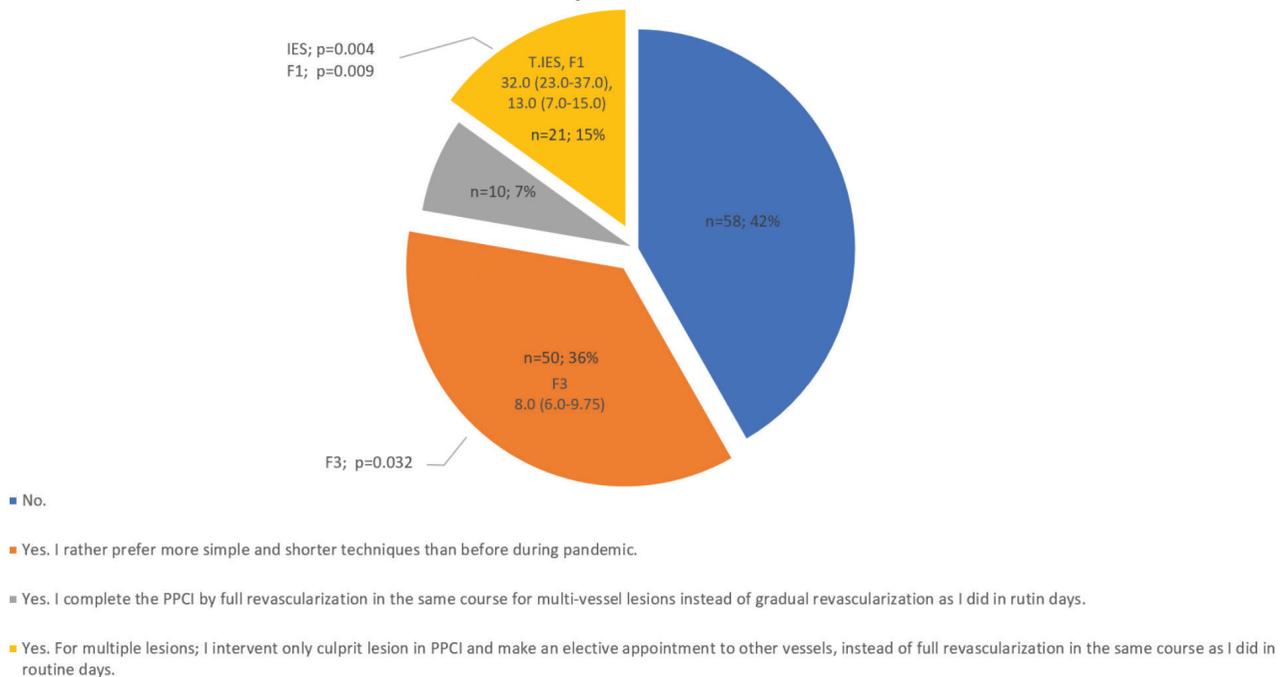
For Factor 5; "Feeling of being protected": The cardiologists who changed the PPCI technique on the culprit lesion [n=78, 3.00 (2.00-4.00); p=0.016] had higher F5 scores. The major change for the cardiologists with higher F5 scores [n=50, 2.50 (2.00-4.00)] was performing simpler and shorter techniques in PPCI during the pandemic, but it was not statistically significant (p=0.052).

Discussion

It is shown that Turkish invasive cardiologists major treatment choice for patients with STEMI was PPCI during the initial COVID-19 outbreak, even they felt worse all in all, less willingness to work, and higher anxiety about infection, which means higher total IES, F1, F2, and F3 scores in the study.

Different psychological impacts of COVID-19 pneumonia had different effects on cardiologists. F3 score, in other words, anxiety about the infection, was the major determinant stress-related factor for the treatment strategy. It is shown that lytic therapy came to the fore again for the cardiologists with the highest anxiety level about COVID-19 pneumonia regardless of the patient and hospital characteristics, in real-life. The study results showed that majority of the Turkish invasive cardiologists continued performing PPCI in patients with STEMI during the pandemic, and none of any professional or individual data included in the study had an affect on this choice. Even the majority of the participants did not change their routine practice, they felt worse all in all, less willingness to work, and higher anxiety about infection as similar to other healthcare workers in other countries(13). Feeling the psychological impacts of COVID-19 pneumonia at different levels and different forms made differences on participants' PPCI treatment approaches. Culprit lesions' complexity and operator's treatment strategy determine the intervention time during PPCI. The participants who continued to perform PPCI and felt higher anxiety about infection, which means higher F3 scores in the study,

Is there any change in your treatment approach to lesions during PPCI in STEMI patients during the pandemic?



Graphic 1b. Is there any change in your treatment approach to lesions during PPCI in STEMI patients during the pandemic?

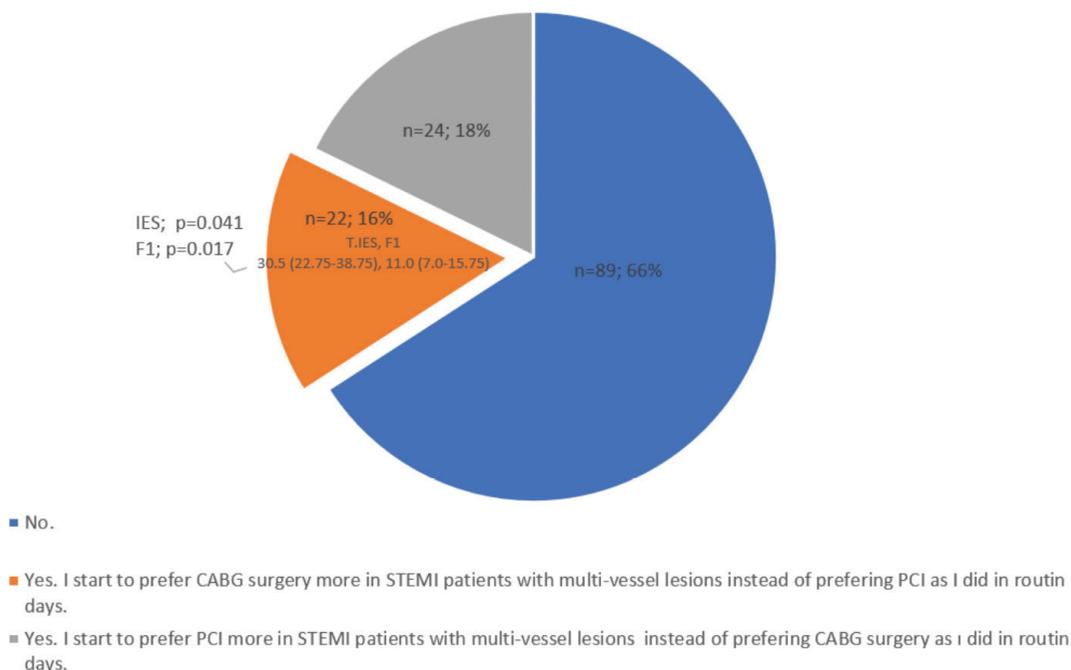
IES: Impact of Event Scale, F1: Daily Moods; F3: Anxiety about infection, n: number of participants, STEMI: ST-segment-elevation myocardial infarction

preferred more simple and shorter techniques during PPCI. The high level of anxiety has created a move to minimize the close communication time with COVID-19 unknown STEMI patients during the procedure since as a way of protection themselves. On the other hand, the participants who continued to perform PPCI and had higher total IES and F1 scores, which means feeling worse all in all and lower daily moods in the study performed different techniques in patients with STEMI. The difference was about the multi-vessel disease therapeutic approaches of patients with STEMI. When compared with the old routine days, these participants preferred interfering with only the responsible coronary artery instead of full revascularization during PPCI and rather preferred the CABG procedure after culprit lesion revascularization in the study. With this data, it is shown that a higher total IES and F1 score effect were related to patients with STEMI next -step treatment protocols after culprit lesion revascularization. The cardiologists who changed the PPCI technique on culprit lesions during the pandemic had a higher F5 score, which means they felt more the feeling of

being protected by national and local governments and by hospitals.

The cardiologists affected by the five stress-related factors differently based on where they are working. Working in a university hospital or private hospital had different psychological impacts on cardiologists during the earlier pandemic period. The participants working in university hospitals had a significantly higher total IES score, which means feeling worse all in all, higher F3 score that means higher anxiety levels about infection and higher F4 score that means feeling a lack of medical knowledge about infection more in the study. As we known, the transmission dynamics of the virus were not fully understood at the beginning of the pandemic⁽¹⁴⁾. With the thought that it originates from this point, the participants with higher F4 scores in the study used additional vitamin-mineral supplements some or ever day even they did not use them before the pandemic started. The participants working in a private hospital had significantly higher F2 scores, which means feeling of less willingness and ability to work. Besides where the cardiologists were

Do you think is there any change in your treatment approach to multi-vessel lesions in STEMI patients during the pandemic?



Graphic 1c. Do you think is there any change in your treatment approach to multi-vessel lesions in STEMI patients during the pandemic?

IES: Impact of Event Scale, F1: Daily Moods, n: number of participants, STEMI: ST-segment-elevation myocardial infarction

working, working in require at nights and in a hospital set aside a catheterization laboratory for patients with COVID-19 pneumonia had a higher F2 score in the study. Although the survey across the country, most of the participants were from Aegean (n=33, 24.0%) and Marmara regions (n=43, 32.0%), the West part of the country. None of the five stress-related factors was significantly different between the regions or the duration of professional time as a cardiologist in the study.

The study reported that five stress-related factors were not significantly affected by age, gender, marital status, and living with someone ≥ 65 years old or ≤ 18 years old in the same house (for all variables $p > 0.05$). The Centers for Disease Control and Prevention reported that individuals older than age 65 make up 31.0% of COVID-19 infections, 45.0% of hospitalizations, 53.0% of intensive care unit admissions, and 80.0% of deaths caused by this infection in the United States⁽¹⁵⁾, which means older individuals are more likely to obtain COVID-19 and have worse outcomes than the general population. In the study, there was only one participant over 60 years old which means negligible number of participants and 77.0% (n=104) of the participants were between 30-49 years old which means not a real risk factor for COVID-19 pneumonia. There were 92 (67.6%) participants were living with someone ≤ 18 years old in the same house. In comparison with adults, the number of confirmed pediatric cases was very low, and the severity and mortality rates were even lower during the initial pandemic outbreak^(16,17). As expected, especially the question "Anxiety about infecting family" and five stress-related factors were not affected by living with someone ≤ 18 years old in the same house. There were 11 participants living with someone ≥ 65 years old in the same house, quite interestingly this group did not have statistically significant higher scores especially for the question about anxiety about infecting family and the other five stress-related factors. Probably, it was related about the way how they protect themselves during pandemic, but this subject did not evaluated in the study. Besides being married or living with someone in younger or older ages in the same house, 40 (29.4%) participants made themselves apart from their family during the pandemic period. These 40 participants had statistical significantly higher IES score and F1 Score, which means feeling worse, uncomfortable, and stressfully during the pandemic period.

An analysis by the joint World Health Organization China fact-finding mission found that patients older than age 60 and those with comorbidities had the highest risk for severe disease and death. The case fatality rate in patients without

comorbidities was 1.4%, whereas the case fatality rate was 13.2% for patients with cardiovascular disease, 9.2% for patients with diabetes, 8.4% for patients with hypertension, 8.0% for patients with chronic respiratory disease, and 7.6% for patients with cancer⁽¹⁸⁾. In this study, although 97 (59.8%) participants did not have any prognostic risk factor for COVID-19 pneumonia, active smoking was the most common (n=17, 10.4%) prognostic risk factor for COVID-19 pneumonia. Cardiologists who had obesity as a risk factor for COVID-19 pneumonia had a higher IES score in the study. Even there are very few available data on body mass index (BMI) for patients with COVID-19 infections, BMI was significantly higher in patients with a severe form of COVID-19 infection⁽¹⁹⁾ was published in a retrospective analysis of 112 patients with COVID-19 infection by Peng et al.⁽¹⁹⁾ The non-survivor patients (15.1%) had a significantly higher BMI than survivors in the paper. Another study on 30 medical staff reported by Liu et al.⁽²⁰⁾ showed that medical staff with severe disease had a higher BMI. With the thought that it originates from these points, the cardiologists with BMI ≥ 30 had significant higher total IES score during pandemic in our study. The five stress-related factors were not significantly affected by any other risk factors of participants in the study.

Study Limitations

Participation in the survey was based on voluntariness. Even the survey conducted to 1000 cardiologists randomly, participation in the study was 13.6% that makes the survey a small sample -sized study. It is a small sample size study, but the power of the study was 98.53%. Our study results respond to an initial outbreak of the pandemic, which was the pre-vaccine era, with lots of unknown about COVID-19 infection in daily practice. Results of the study may show differences if the questionnaire could be sent to the same participants in post-vaccine era. It is impossible to generalize the results of the pre-vaccination study to the entire pandemic process.

Conclusion

This is a unique study evaluating cardiologists real-life STEMI treatment strategies with the IES during the COVID-19 pandemic. In this study, it is shown that anxiety about the infection was the major stress-related factor effecting the STEMI treatment approach and different stress-related factors effected cardiologists' STEMI treatment approaches differently during the earlier pandemic period.

Ethics

Ethics Committee Approval: The study was approved by the University of Health Sciences Turkey, İzmir Tepecik Education and Research Hospital Ethics Committee (decision no: 2020/8-1, date: 08.07.2020).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: N.B.D., B.K., Design: N.B.D., B.K., Data Collection or Processing: N.B.D., B.K., Literature Search: N.B.D., Writing: N.B.D.

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