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Stress in COVID-19 Pandemic: Negative and Positive Outcomes, and the Possible Role of Preventive Interventions

COVID-19 Salgınında Stres: Olumsuz, Olumlu Sonuçları ve Önleyici Müdahalenin Olası Rolü

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Abstract

The first aim of this review is to examine stress models and theories that can help prevention of stress in individuals and scociety due to Coronavirus disease-2019 (COVID-19) pandemic. The second aim is to pinpoint the importance of preventive interventions with relevant examples. Thus, innitially, General Adaption Syndrome model will be covered. Then, Transactional Stress Model that captures the role of individual differences in stress processing will be examined. In order to understand how stress can trigger psychological proplems and to understand the factors associated with positive change Diathesis Stress, and Shaefer and Moos (1998) models will be presented. Furthermore, in this review the stress-related effects of similar pandemies, preventive interventions targetting various groups and related research will be covered. Finally, psychosocial support and psychological assistance examples from different countries and Turkey will be included. The review will provide guidance for researchers and professionals, who focus on the effects of COVID-19 and process aftermath of COVID-19.

Keywords: COVID-19, pandemic, stress, coping, preventive intervention

Öz

Bu derleme ilk amacı, Koronavirüs hastalığı-2019 (COVID-19) salgının, kişilerde ve toplumda yol açtığı stresi önlemede faydalı olabilecek stres modellerini ve teorilerini benzer salgınlardaki bulgularla irdelemektir. İkinci amacı ise COVID-19 sürecindeki önleyici müdahalenin önemine dikkat çekerek, örnek uygulamaları ortaya koymaktır. Bu doğrultuda, ilk olarak stres ve stres karşısında kişinin verdiği tepkilerin nasıl oluştuğuna ilişkin Genel Adaptasyon Sendromu modeli ele alınacaktır. Daha sonra, bireysel farklılıkların rolüne değinen Transaksiyonel Stres Modeli değerlendirilecektir. Stresin tetikleyebileceği psikolojik sorunların nasıl oluşabildiğine dair Diatez Stres Modeli'ne ve olumlu dönüşümü belirleyen etmenlerin neler olduğuna ilişkin Shaefer ve Moos'nin (1998)'in modeli sunulacaktır. Ayrıca, COVID-19'a benzer salgınların stres odaklı etkilerine yer verilecek derlemede, önleyici müdahale programlarının farklı gruplardaki uygulamaları da araştırmalarla ortaya konulacaktır. Son olarak, derlemede dünyadan ve ülkemizden psikososyal destek ve psikolojik yardım örneklerine yer verilecektir. Derleme, COVID-19 sürecinde ve sonrasındaki etkileri inceleyecek araştırmacılara ve destek sağlayacak profesyonellere yol gösterici olacaktır.

Anahtar sözcükler: COVID-19, salgın, stres, stresle baş etme, önleyici müdahale

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CORONAVIRUS disease-19 (COVID-19), a shortened version use of Coronavirus, Virus, Disease and 2019, is a contagious disease that can gradually worsens and results in death (WHO 2019, 2020a). In the past, other pandemics of the same dangerous effects leading to death occured in the world. During 1918 Spanish Flu more than fifty million people died (Johnson and Mueller 2002). Between 2002 and 2003 Severe Acute Respiratory Syndrome or SARS (Lo et al. 2005) caused death. In 2009 Spring H1N1 or Swine Flu impacted over 74 countries (WHO 2009, Prati et al. 2011). These pandemics in past showed similar characteristics and parallel treatment were used as in as COVID-19 today. Obviously, the precautions up to date have not been changed much. These precautions are limitations of crowd gathering activities, restrictions on public gathering venues, wearing masks, social distancing, and quarantine and hand sanitation.

We do not know much about psychosocial impact of Spanish Flu except those limited statistical data and implications. More critically, the conditions of Spanish Flu times and those of today limit us to make a comparison between COVID-19 and Spanish Flu. For instance, Spanish Flu takes place during the first half of the 20th century. Unlike today, travel traffic and sufficient food intake (Bootsman and Ferguson 2007) were lower and people per household were higher. However, these differences between conditions of today and early 20th centrury make it impossible to carry out a comparison in terms of psychosocial impact. Therefore, it would be useful to take into account the stress and stress related effects of SARS and H1N1 pandemics in the last 15 years, for examining COVID-19 stress and its impact. Hence, in this review the impact of COVID-19 stress, its positive and negative psychological consequences will be evaluated with respect to stress models in the literature. Within the framework of these models, results of preventive interventions' contributions will be covered with examples and details.

Possible psychological effects of COVID-19

Since psychosocial impact of a pandemic varies in different groups (Qiu et al. 2020), we can suggest that the stress due to pandemic and the extent to which perceived stress can differ. The research have demonstrated that disadvantaged groups in different domains (i.e., individuals with adverse life conditions, groups without health-care access and immigrants) or people under risk due to their work during pandemic can exhibit vulnerability for psychological problems (Maunder et al. 2006, Lancee et al. 2008, McNeill et al. 2016). Furthermore, specific demographic characteristics (i.e., being a woman, having higher education level and older age) can predict both psychological challenges and taking precautions in relation to pandemic (Bish and Michie 2010). Although individual differences in stress responses are important, the decisions and regulations specific to pandemic are critical. When we consider precautions in previous pandemics influencing the number of deaths and infection speed (Bootsman and Ferguson 2007), it is likely to suggest that precautions can also impact the stress levels of individuals.

In Turkey, after having the first case of COVID-19 on 10th of March 2020 and first death on 17th of March 2020 (Sağlık Bakanlığı 2020a), the degree of precautions has been

raised in stages: Suspending country wise education, lock down for elderly over 65 and intermittent quarantines. In addition to physical precautions to impede the speed of virus spreading, under the supervision of Ministry of Health, psychosocial help lines in 81 cities have been established for offering social and psychological assistance to the citizens (Sağlık Bakanlığı 2020b). Further, based on the World Health Organisation (WHO 2019, 20202a) recommendations, various campaigns have been conducted and the importance precautions (i.e., social distancing and quarantine) has been emphasised on different channels to prevent the spread. However, the stress due to these precautions and regulations can vary person to person. Thus, vulnerability to psychological problems or existing psychological issues in individuals can be associated with symptoms or escalation of the symptoms. Moreoever, disadvantaged groups may experience more problems during this process.

In this regard, recommendations to stop potential violence incidences against women spending more time at house, to prevent human rights violations and to protect the handicapped have been announced by WHO (WHO 2020b). In addition, documents have been presented to support coping with post-disease fear, anxiety and stress as well as to facilitate reorganising the changing habits (WHO 2020c). Even though, the attempts to find a cure pandemic in different centres are in progress, there is no medical treatment protocol and vaccine to prevent the pandemic. In line with that, there is a likelihood of experiencing further waves of pandemic (Xu and Li 2020).

Although both clinical trials and medical research have been accumulated and implemented fast, the research in the psychosocial area has recently started. In line with that, it is crucial to conduct effective research to examine both the COVID-19 stress related challenges and the scale of these problems for individuals, families and society. Moreover, the findings of psychosocial research are essential because they can provide a base for intervention programs and present ways to mitigate future waves.

Within this framework, there are two aims of the present review: (1) to examine Selye's General Adaptation Syndrome, Laazarus and Folkmans's (1984) Transactional Stress Model (Lazarus 1991) and also examine Shaefer and Moos (1998) model focusing on positive transformation in order to understand stress due to COVID-19 and stress management. (2) Based on these models, to concentrate on research findings of similar pandemics in order to highlight the importance of preventive interventions while noting suggestions.

Stress models in relation to COVID-19

It has been underlined that during the COVID-19 pandemic, individuals can feel anxiety, despair and depressed mood. Besides these experiences can exacerbate due to socal and economic adversities (Blumenstyk 2020, Wind et al. 2020). Meanwhile, social and economic transformation in this time period, and possible changes in system as well as in habits have been contemplated (BBC 2020, Crowcroft 2020, UNNews, 2020). Hence, basic models and theories would enable to understand both short and long term effects of COVID-19 stress.

General adaptation syndrome

in the literature, stress is defined as individual's response to physiological and psychobiological changes as a result of conditions and demands (Selye 1976). Later, it was suggested that person's cognitive processes and resources can also shape this process of change and effect of stress (Lazarus and Folkman 1984, Lazarus 1991). Selye (1976) defined stress as neurological and endocrinological changes in the biological system, and his General Adaptation Syndrome (GAS) compromised of three stages: Alarm, resistance and exhaustion.

Alarm reaction involves activation of Hypothalamic- Pituitary Gland-Adrenal (HPA) axis, that is responsible from survival functions (i.e., heart beat, digestion etc.) and release of hormones into blood stream that yields a series of changes (İ.e., heightened blood pressure, dampening digestive system). These hormonal changes in the body prepare a person to fight or flight response against a stressor. In the second stage, resistance refers to both positive and negative adaptation. A person can eliminate and cope with stressor or habituated. As a result, a person can return to balance state of biological system (homeostasis) or develop vulnerability to further diseases due to constant fight state against stress. In the exhaustion stage, it becomes harmful because the chronic stress leads to a decrease in life quality and affects function.

For those people experiencing effects of COVID-19, it is important to know which stage that they are in. Hence, the precautions and support for people in different stress stages can vary. For example, a person's needs in resistance stage can be provided by social support is unlike a person's need in exhaustion stage. A person in exhaustion stage may need of protective and preventive psychological support resources. Moreover, during COVID-19, individuals and health professionals can go through a long-term stress, hindering homeostasis. This can threaten both psychological and physical health and result in vulnerability for further health issues.

In this model, it was not addressed why even some people undergo similar experiences, they do not demonstrate same level of stress. However, stress and impact of stress can show variation based on individual differences (i.e., appraisals to events, coping resources). Differentiating from Selye's approach, Lazarus and Folkman (1984) focused on the role of individual differences and adopted a wider perspective to examine both stress experience and coping stress.

Transactional model of stress and coping

in the Transactional Stress Model (Lazarus and Folkam 1984, Lazarus 1991), individual's primary and secondary appraisals are to shape the effects of stress (See Figure 1). The primary appraisals include perceived susceptibility, perceived severity, motivational relevance and causal focus. Such appraisals can influence the coping efforts. The secondary appraisals consist of perceived control over outcomes, perceived control over emotions and self-efficacy. Secondary appraisals can show differences based on individual's coping strategies and social support. Similar to primary appraisals, secondary appraisal can determine person efforts

to cope, problem management and emotion regulation. This process can be reinforced or hindered by person's general coping style and social support. Parallel to that, meaning-based coping that entails positive reappraisal, revised goals, spiritual beliefs and positive events, can lead to revision of aims. In addition, spiritual beliefs and positive events can influence the process. Further, coping effort of individuals can be shaped by meaning making based coping, dispositional coping style and social support. Adaptation aftermath of stress can be associated with emotional well-being as well as functional status and health behaviours.

The stress responses of individuals in pandemics like COVID-19 were examined with respect to listed features. For example, the study by Prati and colleagues (2011) on swine flu demonstrated that perceived threat, risk of having the disease could affect emotional attributions about pandemic. In another study that was conducted indicated that higher depression, anxiety and posttraumatic stress disorder reported by health professionals aftermath of stressful period (Mak et al. 2009). As revealed in studies showing the relationship between stress during pandemics and psychological problems, one of the long-term effects of COVID-19 can be psychopathology. Even though Transaction model highlights the individual differences in psychological problems, it does not take into account contribution of stress specifically. Hence, another model examining the association between stress and psychopathology, namely, Diathesis-stress model (Nuechterlein and Dawson 1984) can be helpful for the COVID-19 and post-pandemic process.

Diathesis-stress model

the model was first developed in an attempt to explain how schizophrenia symptoms give rise. But later it was used to examine the onset of depression and anxiety symptoms (Brozina and Abela 2006, Eberhart and Hammen 2010) and was applied to other psychological problems. In Diathesis-stress model (Nuechterlein and Dawson 1984), both genetical make-up and environmental factors can result in psychological issues. Genetic vulnerability for developing psychopathology and other innate risk factors combine with intense stressors can elicit symptoms. In other words, triggering role of stress is likely if only there is underlying vulnerability. Researches have also indicated that various genetic characteristics are part of underlying mechanism for psychological problems (Tsai et al. 2000, Huang et al. 2004, Neumann et al. 2016, Rao et al. 2017). In line with that, the people who are at risk (i.e., people with psychopathology history) can be evaluated with respect to this model. Further, preventive intervention programs can support such groups. Individual differences in responses can be also shaped by psychological and sociocultural factors. In such cases, Transactional model can be referred.

As Diathesis-stress model (Nuechterlein and Dawson 1984) pinpointed the role of stress and vulnerability factors, contribution of personal resources and protective factors were not covered. Also, the concepts of Posttraumatic Growth (Tedeschi and Calhoun 1996) and Stress-related Growth (Park et al. 1996) indicated that positive change aftermath of adverse life events was a possibility. Hence, people following COVID-19, which can be categorised as an adverse life event, can also experience positive transformation. Therefore, when effects of COVID-19 are explored, it can be valuable to concentrate on positive change as well

as its negative impact. Indeed, demographic characteristics, social support, appraisals and coping styles are found to be associated with not only negative outcomes but also associated with positive transformation (See the reviews of Linley and Joseph 2004, Jim and Jacobsen 2008, Meyerson et al. 2011). While focusing on post-COVID-19, Shaefer and Moos (1998) model, on adverse life events and their contribution to positive transformation can be enlightening.

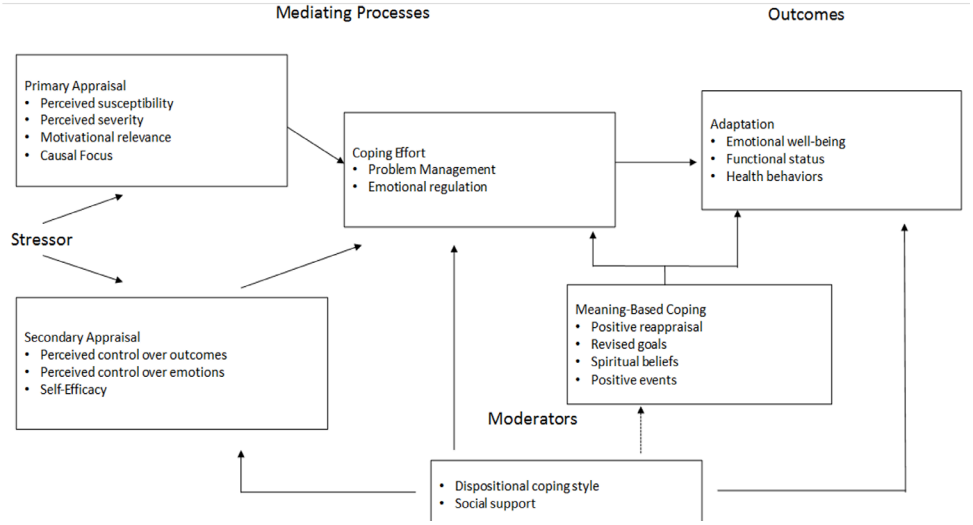

Figure 1. Diagram of Transactional Model of Stress and Coping (Lazarus and Folkam 1984, Lazarus 1991)

Shaefer and Moos (1998) model

in Shaefer and Moos (1998) model explicates how a person can undergo a positive transformation aftermath of adverse life events by different factor groups and systems (See Figure 2). First group of factors are listed under an environmental system and involves social relationships, support network, economical state and home/living condition. Personal system consists of sociodemographic characteristics, self-efficacy, resilience, motivation, health status and history of adverse life events. The environmental and personal systems can interact with each other. They can also contribute to life crises and/transitions. All these factors can determine personal cognitive appraisals and coping responses of individual. In the model, it is suggested that in the face of a life crises, people with approach coping style can show positive reappraisal and adopt active problem solving strategies adhering logical methods. On the other hand, avoidant coping is linked with disengagement with the problem and remaining passive. While people with different appraisals and coping styles can experience positive change and outcomes following life-crises, they can also suffer from long-term effects of life-crises (Shaefer and Moos, 1998). The research on factors associated with positive change and focusing positive transformation following pandemics mostly involves SARS pandemic survivors (Cheng et al. 2006, Lau et al. 2006).

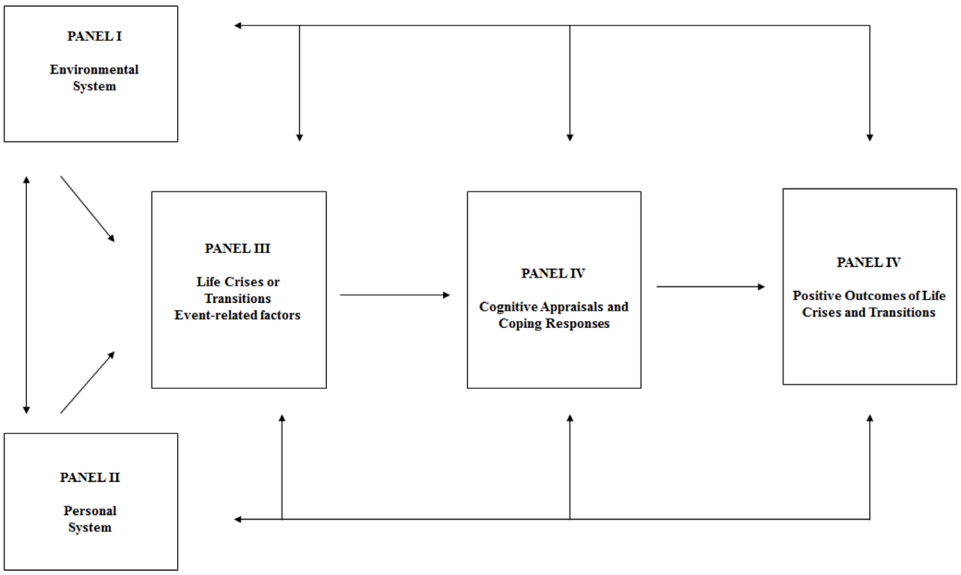

Figure 2. Shaefer and Moos (1998)'s Model

According to Cheng and colleagues (2006) findings individual's coping efficacy positively predicts post-traumatic growth and perceived health, and negatively predicts depression. Based on interviews of 70 SARS survivors, complicated report and difficulties in meaning making were negatively related to one of the negative coping strategies, defensiveness. Further, positive perceived outcomes of SARS had a positive influence on personal and social resources in the 18-month follow-up assessments (Cheng et al. 2006). In another research on SARS survivors, exhibiting growth had more positive relationships with their families and friends, indicated that the survivors also cared their psychological health. Moreover, these variables are negatively related with posttraumatic stress, perceived stress and stress due to SARS (Lau et al.2006). Subsequently, preventive interventions that facilitate factors preventing negative psychological consequences and stimulating aspects for growth would be useful.

COVID-19 and preventive intervention approaches

To examine the health and psychosocial programs, Mrazek and Haggerty (1994)'s well-know and widely used step-wise intervention approach can provide a framework for COVID-19 process. Preventive interventions for chronic health conditions have three phases, namely, primary, secondary and tertiary (Commission on Chronic Illness, 1957 cited from Mrazek and Haggerty, 1994).

Primary prevention aims to stop the new number of cases in addition to already existing ones. The secondary prevention targets to reduce the prevalence rates while the tertiary prevention focuses on identifying and diminishing issues and obstacles of people with health problems. Proceeding from here, Mrazek and Haggerty (1994) took into account criticisms of Gordon (1983, 1987) and categorised preventive interventions into three. The categories

are as follows: Universal preventive measure, selective preventive measure and indicated preventive measure. This three-way grouping enables the scientific investigation of risk and protective factors for health conditions, the interaction of these factors and biological as well as psychological and social effects.

Universal preventive measures concentrate on general population and do not require recruiting specialists (Mrazek and Haggerty, 1994). Specific campaigns and informing society to prevent obesity and encourage healthy diet and exercise can be listed under such measures. Furthermore, images and cancer warnings on cigarette packs that aim to decrease the consumption can be given examples. COVID-19 specific measures include social media posts, posters, TV programs showing preventive measures against the disease. Psychosocial information bulletin on the Ministry of Health web page (Ministry of Health 2020b) consists of possible responses to the pandemic, when to see professional healp and recommendations. These can be added to universal measures. Similarly, the bulletin on burnout and the ways to prevent work-related exhaustion for health professionals working with COVID-19 cases can be given as an example (Güleç et al. 2020). The findings from previous research on pandemics reveal that health professionals experience high level of clinical stress and fear due to risk of catching the disease (Maunder et al. 2004; Ho et al. 2005) and have anxiety about their families (Maunder et al. 2003, Wong et al. 2005). Based on these studies, it would be critical to provide selective preventive measures for health professionals and individuals at risk, working in service sector.

Selective prevention involves measures for people at risk of developing the health condition in the population (Mrazek and Haggerty, 1994). For example, it involves assisting individuals with family history of cancer and focusing on people with a risk of mental health problems. Further, detecting certain vitamin deficiencies in regular tests and offering vitamin supplements can be listed as an example. During COVID-19, the phone-screening and follow-ups for those who are in touch with a COVID-19 positive individual are examples for selective preventions. The help-lines specific to health professionals experiencing psychological issues (Turkish Psychiatry Association 20202) and online therapy programs (EMDR Association Turkey 2020) would fit into this preventive scheme. These interventions would go under psychological first aid title, which entails supporting individuals to cope with stress and empowering them to be more resilient for future psychological problems as well as protecting them from further difficulties (Maunder et al. 2003; Maunder et al. 2008). The other prospective applications (i.e., debriefing) that can be systematically developed under this scheme would be helpful for health professional and people working under risk (i.e., workers in supply chain and factories).

Finally, indicated preventive measures focus on individuals that already underwent screening and started to exhibit initial symptoms. These measures require different vigorous medical tests done and applications by specialised professionals spending more time. For instance, going through regular check-ups and screening tests after detection of markers triggering cervical cancer. In order to fight against COVID-19, individuals who were tested positive but do not show severe symptoms, are followed up at home-setting with regular visitations by health professionals and collecting medical test samples. Another example for such preventions or early phase treatment is providing psychotherapy services for individuals

with innitial symptoms. Compared to universal and selective preventive measures, indicative measures are more costly (Gordon 1983). Therefore, facilitating universal and selective preventions that target larger groups and aims preventing chronic problems would be vital not only for patients and health professionals but also for socioeconomic advantages.

Conclusion

Individuals' stress during COVID-19 can be identified regarding Selye's General Adaptation Syndrome (1976) stages. However, it should be also considered that stress response can vary from person to person and also considered that individual differences can be obvious in appraisals. At the same time it differs based on coping styles and difficulties (Lazarus and Folkam 1984, Lazarus 1991). Besides psychological problems due to COVID-19 stress, growth and positive change can be possible. If factors that covered by Shaefer and Moos (1998) model can be identified timely and included in intervention programs, individuals can show progress in growth. In this regard, examining stress in the society and in specific risk groups can enable various intervention programs and content that prevents further psychological problems. Moreover, it would be beneficial to analyse the programs and steps of planning in countries that challenged by COVID-19 earlier than Turkey.

For instance, interventions and steps to improve psychological well-being vary based on people with different characteristics such as patients with COVID-19 diagnosis, patients under treatment in isolation, patients with respiratory difficulties, patients staying at home with mild symptoms and unwilling to be in a hospital, and potential patients (Dong and Bouey, 2020). In addition, Dong and Bouey (2020) further identified psychological symptom profiles, intervention areas and psychological support principles addressing health professionals, individuals in contact with a COVID-19 positive case, patients resisting receiving health care, vulnerable individuals and general population. Psychological well-being programs in Turkey can utilise these models and application examples in order to ease management of pandemic and lessen its negative psychological impact.

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