Comment on Schäfer et al. “Impact of COVID-19 on Public Mental Health and the Buffering Effect of a Sense of Coherence”: High Level of COVID-19-Related Posttraumatic Stress in COVID-19 Survivors with Low Sense of Coherence

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In August 2020, Schäfer et al. [1] published a clinical note in *Psychotherapy and Psychosomatics* regarding the impact of the COVID-19 pandemic on mental health and the effects of the sense of coherence (SOC). The results of the study suggested that SOC is a protective mechanism for the development of psychopathological symptoms.

Indeed, the COVID-19 outbreak not only caused many deaths and health impairments worldwide, but also resulted in a measurable increase in psychological distress [2, 3]. SOC represents a predominant resistance factor that influences mental health maintenance and stress management [4]. It includes the three components of comprehensibility, meaningfulness, and manageability, which are core concepts in Aaron Antonovsky's salutogenic theory [5]. Recently, Schäfer et al. [1] showed in a longitudinal study (pre- vs. post-COVID-19 outbreak)

of individuals from the general population in Germany that the pre-COVID-19 outbreak SOC and psychopathological symptom levels were predictors of changes in SOC and psychopathological symptoms. Participants with a higher score for COVID-19-related stress indicated an increase in psychopathological symptoms and a decrease in SOC. In fact, Schäfer et al. also showed that individuals with a low SOC exhibited elevated levels of psychopathological symptoms (pre- vs. post-COVID-19 outbreak).

There is probably no higher level of COVID-19-related stress than that experienced by those who are themselves infected with the disease. Indeed, COVID-19 survivors appear to exhibit increased psychological burden during and after the period of infection [6, 7]. Insomnia,

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fear, and post-traumatic stress disorder were the most common symptoms, along with depression, somatization, and anxiety [6]. Therefore, when discussing psychological distress, COVID-19-related stress, and resilience factors such as SOC, a particular focus should be on COVID-19 survivors.

In a cross-sectional study, we recruited COVID-19 survivors ($n = 214$) between April 29, 2020, and March 5, 2021. The participants attended an outpatient clinic at the University Hospital of Essen (Germany) that provided structured follow-up care for patients whose symptoms are *prima facie* related to their past COVID-19 diagnosis. The mean time since the diagnosis was 137 days ($SD = 85.768$, median = 122). The sex ratio was relatively equal (54.25% female), and the average age was 49.7 years ($SD = 14.41$). The psychosomatic assessment included, among other measures, the 9-item version of the Sense of Coherence Scale (SOC-L9) [8] and the Impact of Event Scale-Revised (IES-R) [9], as well as items about the COVID-19 diagnosis and sociodemographic and medical data.

In line with Schäfer et al. [1], the time-dependent effects of stress and post-traumatic symptoms related to the past COVID-19 diagnosis on SOC levels were analyzed. For this, the IES-R was median split to define low and high COVID-19-related post-traumatic stress. High or low COVID-19-related post-traumatic stress, the time since the COVID-19 diagnosis (in days), and their interaction term were entered into a robust regression model predicting the SOC levels.

Results from the robust regression analysis point to a significant interaction between the time COVID-19 was diagnosed and COVID-19-related post-traumatic stress ($b = -0.058$, $p = 0.005$). In detail, the data reveal that, while for people with low traumatic stress scores the SOC is and remains high after the COVID-19 diagnosis (slope = -0.002), people with high levels of COVID-19-related post-traumatic stress show less SOC after the infection. Participants with higher SOC perceive less posttraumatic stress (slope = 0.037). The interaction remains significant even after controlling for sex, age, education, and treatment modality. Our study indicates that a low SOC level is attended by increased symptoms of a post-traumatic stress disorder, at least within a short time window after the infection. Subsequent analyses using the IES-R subscales indicate that this recovery predominantly affects symptoms of hyperarousal and avoidance. However, COVID-19 survivors with COVID-19-related trauma symptoms show an improvement in both IES-R and SOC scores with time after infection. Indeed, such a relationship might take place by a reinforcement of psychological

resources such as the SOC after a COVID-19 diagnosis. A stressful life event like surviving a COVID-19 infection might shatter the well-being of especially those individuals with low SOC scores in their personal beliefs of physical integrity, and the effects may reverberate long after their recovery from the disease. Yet, even people with elevated levels of burden might recover after a proper amount of time.

To conclude, the data of COVID-19 survivors supplement the results of Schäfer et al. [1]. Although some COVID-19 survivors exhibit lower levels of SOC and higher post-traumatic distress initially, these dimensions normalize over time: COVID-19 survivors seem to adjust after cessation of the disease, which hints toward a long-term recovery from mental health burden. Furthermore, a re-examination of the general population, as previously suggested by Schäfer et al. [1] themselves, as well as COVID-19 survivors would have high scientific value. Indeed, such research could focus on analyzing a possible adaptation to the COVID-19 pandemic over time.

Conflict of Interest Statement

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Author Contributions

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