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Research Article

Impact of Covid 19 On Sense of Coherence: A Cross-Sectional Study

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Abstract: **Objective**: The primary aim of this research was to comprehend SOC's role in psychological responses to the epidemic. **Methodology**: This descriptive cross-sectional research was conducted among residents of the Riyadh Region. The survey was conducted online in June 2020 via Google Forms. The current study examined the data from 873 people who completed the Directed Questions Scale (mean age: 45.1 8.3 years; 376 males; 497 females). Well-being was assessed using the WHO-5 scale, developed by Bech and colleagues, while the Antonov sky scale was used to measure the sense of coherence. Data was measured using SPSS Statistics. Mean, ANOVA and regression analysis were used to characterize the data. **Results**: Knowing infected persons ($p = 0.163$) and having plans fall through ($p = 0.246$) had no discernible impact on well-being. The interaction was considerably impacted by financial constraints ($p = 0.004$). Participants with lower levels of SOC did not experience a decline in well-being as a result of their financial condition ($p = 0.178$), whereas participants with moderate and higher levels of SOC did ($p < 0.001$ and $p < 0.001$, respectively). The findings determined that SOC does not in this way lessen the effects of stressors on well-being; therefore, it rejects the first hypothesis. **Conclusion**: The present study suggests that SOC is more a predictor of people's mental health than a protective factor. Our results highlight the value of giving participants the resources they require to feel in control, relatable, and significant during large events like the COVID-19 pandemic.

Keywords: Sense of Coherence, Covid-19, Well-being, Predictors.

INTRODUCTION

The SARS-CoV-2 coronavirus has been spreading worldwide for more than a year since it was discovered in the Chinese city of Wuhan at the end of 2019. Early in 2020, the virus-based disease went by the name COVID-19, and the World Health Organization declared it a global pandemic on March 11, 2020. It is the epidemic that has affected the most people in the twenty-first century to date [1]. The clinical history of the disease can be from mild or asymptomatic to mild or even high to bring forth severe respiratory failure leading to death of the person. Elderly patients and those with concurrent illnesses have a poorer prognosis [2,3]. Global statistics of the WHO reported 126 million affected cases of Covid along with a 2.8 million mortality ratio during the first wave worldwide [4]. In Saudi Arabia, the first SARS-CoV-2 coronavirus case was found on March 2, 2020. Nearly seven million people had the virus by February 25, 2022, and more than 8993 had died [5].

COVID-19 affects both physical and mental health like any other viral disease spreading through epidemics. The outbreak has transformed living lifestyles within a very short time. COVID-19 is strictly reducing all the elements of daily life, posing a great threat to public health worldwide [6]. The high rise in the number of reported cases and deaths, quarantine, the loss of social bonds, closure of companies and schools, and restrictions on movement and freedom are stressful issues for society [7]. However, the outbreak has negative psychological impacts on them despite the fact that most people remain uninfected and healthy.

A contagious disease outbreak might influence life satisfaction, that is, their cognitive appraisal of their lives [8]. An infectious disease outbreak increases societal anxiety and hysteria, just as in recent and previous outbreaks [9]. People worry about the COVID-19 epidemic, dying or losing loved ones, and coming into contact with sick people [10-12]. Constant exposure to information about the numerous fatalities and escalating cases associated with COVID-19 is detrimental to people's psychological health. These feelings can include

anxiety, depression, and concern. The coronavirus reduces the quality of life by endangering one's safety and will to live [13, 14]. Therefore, COVID-19 fear makes people happier and less pleased with their lives [15,16].

Sense of coherence (SOC) is an important tool for combating a pandemic. Sense of coherence (SOC) is a dispositional orientation considered adaptive in terms of personality and assists in coping with difficult events. SOC considers the importance, comprehensibility, and manageability of an issue. The more someone can comprehend and integrate (comprehensibility), handle (manageability), and make sense of (meaningfulness) the experience or illness, the better their ability to successfully manage the illness [17]. Numerous studies have shown that high SOC levels facilitate coping with life's inevitable problems [18,19]. SOC is also crucial when dealing with major stressors, such as the continuing epidemic [20]. It has been found that SOC modulates the association between symptoms, stress, coping, and life satisfaction as well as the relationship between traumatic experiences and psychological well-being [21]. However, the underlying mechanisms are still not fully known, even though it has been amply proven that stressful and traumatic situations are favorably connected with mental health, both before and after the epidemic. To our knowledge, no empirical comparison was conducted between SOC and COVID-19 except the work of [22] in 2020. Thus, we mainly aimed to have an understanding of SOC in the context of psychological reactions toward the epidemic. We surmised it would become a mediator. This is because the individuals who are stressed due to the situation would presume to have a lower SOC in comparison with others, and this, in turn, would presuppose a lower level of psychological health. Contrary to the moderating effect, a mediating impact does not imply any protection from the pressures that stressors bring. Furthermore, the second hypothesis of the research was that SOC cannot be regarded as a protective factor if it mediates the impacts on mental health; rather, it should be seen as a part of or a precursor to mental health.

METHODOLOGY:

This descriptive cross-sectional study was carried out among residents of the Riyadh Region. The survey was conducted online in June 2020 via Google Forms. A total of 1,900 Saudi men and women between the ages of 20 and 50 who resided in the Riyadh region participated in the survey anonymously. We examined the data from 874 participants who completed the Directed Questions Scale [23]. The DQS was applied to these questions to detect and remove participants who were not paying enough attention to the questions. Participants were disqualified from the study using the DQS if they had a satisfied reply style, such as answering without carefully reading the question. This response indicates the respondent does not want to invest attentional resources in the inquiry.

We used power analysis, which we performed using G*Power 3.1.9.4 software [1], in order to determine the required sample size. The parameters we adopted for the computation were: the test family is t-tests, the statistical test is means difference between two independent means (two groups), an a priori power analysis to compute the required sample size, given α, power, and effect size. The parameters were inputted as two-tailed, with an effect size d of 0.2, equivalent to a small to medium effect size [18-19], α err prob of 0.05, power of 0.95, which is (1-β err prob), and N2/N1 at an allocation ratio of 1. Using this, we found that a total sample size of around 1,842 participants would be needed to detect a small to medium effect size based on power analysis with a power of 0.95 and an alpha level of 0.05. We sought to get a sample size close to this as a prerequisite for getting a good representative sample from the population of Riyadh region and also filling in the likely missing data that may arise.

Participants were given an online survey for written informed consent. Data was collected anonymously. Potential respondents at the interface of the survey were provided with a text explanation of these moral dilemmas. The ethical committee provided approval for the conduct of this study.

The initial questions for the survey are about the participants' or respondents' sociodemographic information regarding age, gender, and dwelling location. Well-being was assessed using the scale WHO-5 developed [24], which was translated into Arabic and adapted to the Arabic language. There is a six-point Likert scale grading all five items on this test from 0 "never" to 5 "always." Better ratings on the scale indicate higher levels of well-being, which were calculated as the sum of all factors. Cronbach's alpha = 0.84; the internal consistency of the scale in our sample is excellent.

The 13-item SOC-13 scale developed [17] was used to evaluate the sense of coherence. With different verbal anchors, a seven-point Likert scale was used to score the responses to the items (from 1, very seldom or never, to 7=, very often). These statements include "I have feelings I'm in an unfamiliar situation, and I don't know what to do" and "I have feelings I'm not sure I can keep under control." The scores for five items—1, 2, 3, 5, and 7—are reversed before being

added. Higher scores indicate higher SOC. The overall score might vary from 13 to 91.

The COVID-19 event's stressors were evaluated using three single items. Four stressors were chosen based on findings from pre-study [25-29] and additional observations made during the pandemic: being among sick people, having financial difficulties, and dealing with disruptions of plans. As a result, it was possible to evaluate the consistency of the results and compare the effects of SOC for various stressor types. As part of the study, each stressor was graded on a dichotomous scale (coded as 0—stressor absence and 1—stressor present). In order to assess the participants' familiarity with carriers of the COVID-19 virus, we asked them if they knew anyone who had tested positive. Participants are free to declare whether they agree or disagree with the claim. Financial pressures were investigated by asking participants if their financial situation was worse now than it was before the epidemic. The question's response was graded using a five-point Likert scale (1—does not apply at all to 5—does apply thoroughly). For the research, responses one through three were viewed as rejection, but responses four or five were dealt with as approval.

Disruption of plans was evaluated by determining whether concrete plans were halted due to the COVID-19 problem. For this study's analysis, the short-, middle--, and long-term plans provided in the answer format were condensed.

Statistical Analysis:

All the collected information was analyzed using the Statistical Package for Social Science software (Version 26.0). ANOVA was used to compare descriptive data. We ran multiple regression models to delve deep into the relationship of study variables in keeping with our objectives of research. Descriptive data between demographic groups were compared via ANOVA, which helps identify where differences may lie based on demographic criteria such as age, gender, or location. Initial associations between variables are guided by the computation of bivariate Pearson correlations. To test the moderation hypothesis, we used hierarchical regression: through this method, we enter control variables - such as age, gender, and financial stress by step. This helped to understand uniquely how SOC acts as a moderator of well-being over and above influential other factors that help to give in-depth interaction of SOC with stressors.

RESULTS:

Table 1 shows that 873 participants were enrolled in the study (mean age: 45.1±8.3; 376 males;497 females). Most participants, 570 (58.1%), were aged from 20 to 30 years old, 152 (17.4) were aged from 31 to 40 years old, and from 41 to 50 (16%), while the remaining 74 (8.5) were more than 50 years old. The job status of study participants after Covid pandemic was 328(37.6%) teachers, 157(18%) unemployed, 17(1.9%) retired, 219(25%) were workers, 13(1.5% were business man and remaining were students and employed.

The mean and standard deviation were used to measure the responses of SOC parameters. ANOVA test was performed by using job and salary status as an independent factor. The current findings showed that social factors of SOC did not show association, as the p-values were more significant than 0.05. However, the psychological parameters were highly affected by the job status after COVID-19. The detailed mean analysis is shown in Table **2.**

Table 1: Demographic Characteristics of Participants

Characteristic	**No. (%)**
Sex	
Male	376 (43.1)
Female	497 (56,9)
Age	
20-30 31-40 41-50 >50	570 (58.1) 152 (17.4) 140 (16.0) 74 (8.5)
Educational level	
illiterate reads and writes high school university postgraduate	2 (2.0) 19 (2.2) 158 (18.1) 605 (69.3) 89 (10.2)
Job-status	
housewife businessman student unemployed retired adviser teacher student and employed	13 (1.5) 1 (1.0) 355 (40.7) 157 (18.0) 17 (1.9) 1 (1.0) 328 (37.6) 1 (1.0)
Salary before Covid	
5000 or less	525(60.1)
5000 - 10000	161 (18.4)
10000 - 15000	90 (10.3)
15000 or more	97 (11.1)
Salary after covid 19 5000 or less	504 (57.7)
5000 - 10000	172 (19.7)
10000 - 15000	100 (11.5)
15000 or more	97 (11.1)

Place of residence	
Al Arabiya	7(8.0)
Riyadh	465 (53.3)
Zulfi	168 (19.2)
Ghat	3 (3.0)
Almajmaah	209 (23.9)
Muzahmiyya	1 (1.0)
Tumair	1 (1.0)
Horimala	1 (1.0)
Hotel Bani Tamim	1 (1.0)
Hautat sugar	16 (1.8)
Shaqraa	1 (1.0)

Table 2: Comparison of SOC scale parameters using r-square

Parameters	Mean ± SD	R^2	p-value
Do you think the events going on around you don't actually concern you	3.83 ± 1.93	0.012	0.39
Have you ever been taken aback by someone's behavior that you had assumed they knew well?	4.58 ± 2.1	0.017	0.13
Has it ever occurred that you had individuals you relied on let you down	4.5 ± 2.19	0.015	0.204
Until now, your life seemed to have a purpose	5.83 ± 2.02	0.044	<0.0001
Do you feel that the things you do every day are meaningful	3.50 ± 1.97	0.025	0.017
When something happens, have you generally found a way to deal with it	4.86 ± 2.07	0.015	0.202
Are you having repeated thoughts about COVID-19	4.52 ± 2.60	0.019	0.089
Do you feel that you are receiving unjust treatment	3.57 ± 1.97	0.035	0.001
Do you feel as though you are in a new scenario and are unsure of what to do	3.68 ± 2	0.049	<0.0001
Do you have a lot of conflicting emotions and ideas?	4.65 ± 2.1	0.032	0.002
Do you ever experience internal feelings that you would prefer not to experience	4.9 ± 2.1	0.045	<0.0001
Even people with high moral character occasionally feel like sad losers in a particular situation.	4.81 ± 2.01	0.033	0.001
How frequently do you feel that the activities you engage in on a daily basis lack significance?	4.35 ± 1.88	0.016	0.163
How frequently do you question your ability to maintain control	3.96 ± 1.76	0.03	0.003

The impact of stresses related to the COVID-19 pandemic on well-being was initially investigated by using multiple linear regression. Stressors were responsible for 23% of the variance ($F(4, 112) = 8.27$, p .001, R2 =.23). Financial stress was linked to lower wellbeing (p 0.001). The knowledge of diseased individuals and disturbed plans had little impact on their well-being (Table 3).

Table 3: Effect of stressors on well-being (Regression analysis)

Parameters	Constant b	Standard error of estimate (SE)	β coefficient	P-value
Constant	14.7	0.9	-	<0.001
Disruption of plans	-1.62	1.04	-0.14	0.14
Financial strains	-4.17	1.10	-0.34	<0.001
Knowing about infected people	0.44	0.87	0.04	0.634

The current study carried out a moderation analysis to verify our initial hypothesis, which claimed that SOC acts as a safeguard for mental health. Stressors served as predictors, SOC as moderators, and well-being as an outcome. Knowing infected persons (p = 0.163) and having plans fall through (p = 0.246) had no discernible impact on well-being. The interaction was considerably impacted by financial constraints (p = 0.004). Participants with low levels of SOC did not experience a decline in well-being as a result of their financial condition (p = 0.178), whereas participants with moderate and high levels of SOC did ($p < 0.0001$ and $p < 0.0001$, respectively). The current findings determined that SOC does not, in this way, lessen the effects of stressors on well-being; therefore, it rejects the first hypothesis (Table 4).

Table 4: Moderation analysis of SOC on well-being

	B	SE	F	ΔR^2	p-value
Disruption of plans	-0.09	0.07	1.36	0.01	0.24
Financial strains	-0.23	0.08	8.86	0.05	0.004
Knowing the infected Covid cases	0.09	0.07	1.97	0.01	0.163

This research divided SOC into its three components—manageability, comprehensibility, and meaningfulness—and conducted the analysis again. As a result, we examined each of the three facets separately for effects that produced significant findings for the global SOC. First, using financial difficulties as a predictor, well-being as a result, and

all three SOC components as moderators, we conducted the moderation analysis. Each moderator's analyses were done separately and showed significant association (Table 5).

Table 5: Analysing moderator effect of SOC components with respect to stressors on well-being

	b	SE	β coefficient	P-value
Overall SOC	0.23	0.02	0.54	<0.001
Meaningfulness	0.33	0.06	0.25	<0.001
Manageability	0.26	0.06	0.25	<0.001
Comprehensibility	0.16	0.05	0.18	0.003

Then, using all aspects of SOC as mediators, financial pressures, study circumstances, and disrupted plans as predictors, and well-being as the outcome, we ran parallel mediation studies. All SOC components in this investigation served as mediators between the direct and indirect impacts of stresses. The only exception to this rule was meaningfulness, which did not operate as a mediator between well-being and discontent with the study scenario (Table 6).

Table 6: Analysing mediators effect of SOC components with respect to stressors on well-being

	B	SE	95% C.I
Meaningfulness	-0.38	0.19	-0.81 to -0.06
Manageability	-0.62	0.22	-1.10 to -0.25
Comprehensibility	-0.39	0.1	-0.79 to -0.10

DISCUSSION

The present study aimed to determine the role of a sense of coherence in fostering psychological well-being in the face of the COVID-19 pandemic under highly stressful conditions. Notwithstanding the vast literature and evidence supporting the positive relationship between SOC and health, no clear mechanism has been shown between SOC and the stress-health link. This is the first study that examines whether and how SOC influences the relationship between psychological health and COVID-19 illness experiences, for example, knowing people with the disease and worrying about getting COVID-19 in a large sample of Saudi citizens. The study was conducted on the two possible roles of SOC in the lives of Saudi Arabian citizens who live in Riyadh: that is, as a moderator of any set of COVID-19-related stressors and not as a direct buffer against the impacts these have on mental health. SOC provides a theoretical framework for the promotion of health through the cognitive, motivational, and behavioral elements that influence well-being and health. However, SOC poses several challenges: conceptual overlaps and not so clear whether it's a moderator or a mediator in the outcomes of mental health. This paper aimed to clarify the ambiguity in the mechanism of SOC on mental health because the adaptation of some interventions depends on the understanding that matters.

In this regard, our findings indicated that the impact of the COVID-19 pandemic on the general population in Saudi Arabia was significant. Some of these stresses are believed to have negatively impacted the participants' SOC, eventually affecting their mental health. It is not, however, known whether such effects will appear right away or thereafter with respect to SOC and mental health. From this study, it is evident that the findings were different from those of previous research. In many of these studies, including those performed by Erikson et al. [21], Mana, Bauer et al. [30], Mana, Super et al. [31], and Schäfer et al. [22], the authors showed a positive relationship between mental health and stressful or traumatic events during a pandemic. According to Ahorsu et al. [32], the fear of SARS-CoV-2 increases psychological distress and worsens mental health. On the contrary, there are different findings obtained from the literature about mental health alterations during the pandemic. Some have described the influences on negative changes in mental health [33-38]. Others, however, described positive aspects or no change during the pandemic [39, 40]. A Turkish study [13] indicated that the fear of SARS-CoV-2 lowered life satisfaction, and Harper et al. [41] concluded a reduction in overall well-being. Robinson et al. [36] noted important differences in the responses of COVID-19 to people's mental health that remain unexplained.

In many instances, a clear distinction needs to be made between the moderation and mediation roles of SOC because they determine the relationship between SOC and mental health differently. In a mediating role, for instance, SOC could decline with challenges in response and consequently affect mental health, thus resulting in depression in SOC and well-being together. If the SOC levels have a moderating role, then the levels can determine how the people would respond to stressors, whereby the ones with higher SOC would initially appear less impaired in mental health. If SOC is viewed as protective, then SOC levels would be expected to buffer, and thus, lower SOC will be more negatively affected by stress. Barni et al. [42] offered empirical evidence for a buffering effect, like the fact that lower SOC was associated with lower well-being among those who knew infected people during the third week of Italy's first lockdown. Nonetheless, the results of this study conflicted with those findings and showed that SOC did not display any buffering effect but worked, instead, in a moderating fashion in a direction opposite to the one predicted.

A number of reviews analyzed the effects of economic stress induced by the pandemic on SOC and mental health [39-40, 43-44]. They indicated that decreased SES heightened vulnerability to COVID-19 infection and also exacerbated mental distress [45, 46]. An international review revealed the same patterns where employment insecurity related to precarious contracts was reported, with higher levels of mental health disorders even for those employed full time [45-47]. A cross-sectional study conducted on 1,441 US citizens at the beginning of the epidemic revealed that financial strain and reduced financial capital was associated with greater rates of depression [48].

University students (605 of 874) were the majority of respondents in the present study and the effect of the epidemic could be clearly observed as many students preferred to quit university after the lockdown in the initial stages. The results are of further significance in the sense that the SOC needs to be improved in an attempt to aid the university students regarding the influence of the pandemic. An earlier study like Mana, Bauer et al. [30] indicated that the social support enhancement may help people bear crises like the COVID-19 situation much better. In addition, Bonanno et al. [50] reported that the social support predicted psychological resilience and recovery among the SARS survivors in the initial phase of the SARS epidemic. Other research has emphasized positive impacts of psychoeducational interventions [51] and life-skills programs [52] in the context of higher education students during the COVID-19 period.

Findings of this study suggest that psychosocial interventions should target increase in SOC levels regardless of current sources of stressors especially but not only for those with lower levels of SOC. Not all stressors included in this study were detrimental to SOC and well-being. Unlike reports from Italy [42], the strong belief that COVID-19 was infecting others in the same locality did not affect their well-being or SOC. National variations in performance, for instance, the Austrian health system prevented hospital bed shortages [53], which might imply interventions must be aimed not only at targeting individuals and their psychological reactions but also the environment more broadly [54].

However, several potential confounding variables must be kept in mind which could have affected both SOC and well-being outcomes in relation to the COVID-19 pandemic as observed in our investigation. First, prior mental health conditions are a major confounder; because people who experienced anxiety or depression even before the pandemic would have had varying levels of well-being and SOC initially and may therefore have differentially responded to the corresponding stressors presented during the pandemic. These mental health issues may have acted in an independent manner to decrease well-being regardless of the levels of SOC, and the relationships observed between stressors, SOC, and well-being may have been influenced. Also, the level of social support participants had an access to may be a critical aspect in their resilience against the stressors; for example, a participant with big human social support networks may have high levels of both well-being and SOC, that may act as a buffer against the stressors. So, given that we did not directly measure or control for prior mental health status or social support, is that these might be confounding factors that, in themselves, affect the strength of the associations found. These variables should be considered in future research to better determine those factors influencing people's welfare during significant public health crises.

This study has certain limitations related to the measurement of stressors and SOC. The main areas of the early criticism of Antonovsky's [17] scale included its volatility, overlap of its components, and overlap with outcomes related to mental health. Even though a more modern, updated scale hasn't yet been widely adopted, the scale is commonly utilized in studies. The utilization of Google Forms further poses the risk of selection bias because participants needed to get hold of the internet and have basic digital literacy. Thus, those who do not possess these two stand excluded from the study, and thus the sample does not consist of everyone in the Riyadh region. Apart from that, we used self-reported data; therefore, we had the possibility of response bias due to the fact that participants provided socially desirable responses and may have underreported their experience and level of well-being. Another limitation of our study is that it employs a cross-sectional design where this only captures responses at a single point in time which limits the potential capacity to deduce causality and to track changes over time. Additionally, even though standardized scales were employed by us in our measurement of well-being and SOC, it may actually hold true that subjectivity in such measures is very subjective and susceptible to be influenced by the interpretation of a respondent. Lastly, convenience sampling and concentrating on the Riyadh region might be a hindrance when trying to generalize the findings of this study to other populations or contexts.

CONCLUSION:

In conclusion, SOC is more a predictor of people's mental health than a protective factor. The impacts of COVID-19 on mental health were not mitigated by

having a coherent experience of life; instead, a drop in SOC in response to pandemic pressures functioned as a warning indicator of those consequences. Our results highlight the value of giving participants the resources they require to feel in control, relatable, and significant during large events like the COVID-19 pandemic. The current study suggested that, in addition to interventions that educate people on managing stressors and maintaining health, it is critical to establish the environments necessary for young adults to feel manageable, understandable, and purposeful.

Ethics Approval: This study was approved by The Deanship of Scientific Research at Majmaah University with IRB No. MUREC-Jan 27/COM-2022

Consent to Participate: We consent for the publication.

Consent for Publication: The informed consent was taken from the participants before enrolling in the study.

Availability of Data and Material: The data will be available with the corresponding author and will be made available upon request via email.

Conflict of interest: There is no conflict of interest.

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