Research Paper
Anxiety Symptoms Associated With the Severity of Problematic Smartphone Use: The Mediating Role of COVID-19 Anxiety

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ABSTRACT

Objective: The Coronavirus Disease 2019 (COVID-19) pandemic is regarded as the biggest global health crisis in recent decades. The changes in major life domains due to infection control strategies resemble the functional impairment consequential to emotional distress and place many people at greater risk of psychiatric conditions. Meanwhile, the COVID-19 pandemic and associated social distancing have widely increased the usage of smartphones to receive COVID-19-related information in the past year. However, the excessive use of smartphones has deleterious consequences. The current study investigated general anxiety symptoms and COVID-19-induced anxiety, and their impact on problematic smartphone use (PSPU) severity.

Methods: Adults aged 18–75 years were recruited by stratified, probability sampling from a database representative of the population. Among 1080 Hong Kong Chinese (age 18–75 years), a cross-sectional web-based survey was conducted between July 23 and August 25, 2020 (the period of the third wave outbreak of COVID-19 in Hong Kong). Participants were assessed with the measures, including the Depression Anxiety Stress Scale-21, Generalized Anxiety Disorder Scale-7, and Smartphone Addiction Scale-Short Version. Structural equation modeling (SEM) was used to evaluate the associations among general anxiety symptoms, COVID-19-induced anxiety, and severity of PSPU by the Amos 22.0 software.

Results: Using established cut-off scores, our results found that prevalence of at least moderate anxiety level in around 22% of participants. Using SEM, both general anxiety symptoms and COVID-19-induced anxiety were associated with PSPU severity. Moreover, COVID-19 anxiety partially mediated relations between predisposing general anxiety with PSPU severity.

Conclusion: This study provides initial data on the mental health status of people affected by COVID-19. It also investigated the relations between COVID-19-induced anxiety and PSPU severity as a coping mechanism.

Key words: COVID-19, Anxiety, problematic smartphone use, mental health

Extended Abstract

1. Introduction

Background on COVID-19 pandemic

The Coronavirus Disease 2019 (COVID-19) pandemic is regarded as the biggest global health crisis in recent decades, which has already caused an enormous psychological [1] and economic [2] impact on over half of the world’s countries and regions. Different forms of lockdown, quarantine, and social distancing have been implemented across most countries affected by the COVID-19 pandemic. These infection control strategies have changed key life domains, affecting personal mobility, interpersonal relationships, and occupational activities [3].
These changes in major life domains resemble the functional impairment consequential to emotional distress and place many people at greater risk of psychiatric conditions. For example, among a large sample of Chinese (n=5033), 35% had experienced significant psychological distress and the prevalence of anxiety or depression or both was 20.4% during the COVID-19 pandemic [4]. Another sample (n=3480) collected at the initial stage of COVID-19 in Spain showed 21.6% reported probable anxiety, and 18.7% probable depression [5]. Prevalence of probable anxiety and depression was associated with absence of new preventive routines, such as using a face mask when they go out and disruption to regular daily routines, such as healthy eating, sleep, and leisure activities in large population-representative samples of a region [6]. Meanwhile, perceived effective social distancing and lower the negative impact of COVID-19 were associated with more positive and less negative feelings amongst Italians (n=9) [7]. Therefore COVID-19 not only represents a major priority and challenge for the public health and healthcare systems, but also from the mental health perspective.

**Problematic smartphone use and mental health**

Smartphone use can improve substantial productivity and increase social capital advantages [8]. The COVID-19 pandemic and associated social distancing have widely increased the usage of the smartphone to receive COVID-19-related information in society in the past year [9]. However, the relationship between smartphone use and adaptive functioning represents an inverted U-curve, which implied that excessive use has deleterious consequences [8]. The interaction of Person-Affect-Cognition-Execution (I-PACE) model is one of the prominent theoretical frameworks explaining excessive internet and smartphone use [10]. More specifically, I-PACE conceptualizes major categories of variables influencing excessive internet use, including background predisposing variables and affective and cognitive responses. Consequences from predisposing variables involve affective and cognitive response variables, including coping, attention bias, mood dysregulation, and responses to environmental stressors. I-PACE model conceptualizes response variables as mechanisms, by which predisposing variables influence excessive internet use [10].

Problematic smartphone use (PSPU) is defined as extreme levels of use resulting in functional problems, such as social, work, or academic impairment, with symptoms resembling those in substance use disorders [11]. Many previous studies have shown that PSPU was associated with poorer physical and mental health and higher levels of depression and anxiety [12]. Negative affectivity has been investigated in relation to PSPU since excessive smartphone and internet use are conceptualized as maladaptive emotional coping processes for relieving negative affect [13, 14]. Recent studies support additional negative affectivity correlates of PSPU severity, including negative rumination [12], worry [14], and fear of missing out on rewarding social experiences [13]. It has been shown that in the current outbreak of the COVID-19 pandemic, PSPU is an important clinical concern, even though it is not an official mental disorder.

**The present study**

COVID-19 is a potentially fatal disease, and its consequential social isolation from quarantine and distancing increase anxiety [1]. Moreover, home quarantine and social distancing have widely increased the usage of smartphone to receive the COVID-19-related information [9]. Given that social isolation drives emotional distress and negative affect [6], general anxiety, as well as anxiety specific to COVID-19, should, in turn, exacerbate PSPU [12]. The current study investigated the impact of general anxiety symptoms and COVID-19-induced anxiety on the severity of PSPU as a maladaptive emotion coping method. In particular, general anxiety symptoms was hypothesized as a predisposing predictor variable from I-PACE, COVID-19-induced anxiety was modeled as an ongoing response to an environmental stressor, and mediator within the affective/cognitive response category. Our dependent variable was PSPU severity.

**2. Methods**

**Participants and procedure**

Following approval from the university’s ethics committee, a cross-sectional web-based survey was conducted between July 23 and August 25, 2020 (the period of the third wave outbreak of COVID-19 in Hong Kong). Adults aged 18–75 years were recruited by stratified, probability sampling from a database representative of the population [15]. Inclusion criteria were Chinese ethnicity, Cantonese fluency (the most commonly spoken Chinese language and the mother tongue of 90% of the Hong Kong population), and elementary education level or above. Individuals with histories of psychiatric conditions and the presence of cognitive impairments were excluded from the study.

Upon obtaining potential participants’ initial verbal consent, researchers confirmed their eligibility, explained the nature of the study and obtained their writ-
ten informed consent. This study consisted of 1080 participants (Mean±SD age 44.06± 16.74 years), and around half of them (n=575, 53.24%) were female. Fifty-five cases (5.09%) received primary education, 486 cases (45%) received secondary education, and 539 cases (49.91%) received tertiary education or above. Reported average monthly household income ranged from ≤HK $10,000 (10.09%), $10,001–$20,000 (18.89%), $20,001–$30,000 (19.07%), $30,001–$40,000 (22.13%), to >$40,000 (29.81%), with US $1 approximately equivalent to HK $7.80. Of the 1080 participants, 591 cases (54.72%) reported being full-time employed, 295 cases (27.31%) reported being part-time employed, 28 cases (2.59%) reported being unemployed, 56 cases (5.19%) reported that they were housewives, and 110 cases (10.19%) reported that they were retired. The results are summarized in Table 1.

2. Measures

Sociodemographic characteristics

A standardized proforma was used to obtain demographic information, including age in years, sex, marital status, education level, employment status, and monthly household income. It was also used to obtain comorbidity status about whether participants reported the 13 common medically chronic conditions: arthritis, bladder disease, chronic lung disease, diabetes, hearing problems, heart attack, hemorrhoids, hypertension, nephrolith, stroke, visual problems, cognitive problems, and any type of psychiatric disorders.

General anxiety symptoms

The Depression Anxiety Stress Scale-21 (DASS-21) assessed psychological symptoms over the past week. It

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (%)/Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>44.06±16.74</td>
</tr>
<tr>
<td>Sex (female)</td>
<td>575(53.24)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>584(54.07)</td>
</tr>
<tr>
<td>Single/divorced/widowed</td>
<td>496(45.93)</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
</tr>
<tr>
<td>Primary education or below</td>
<td>55 (5.09%)</td>
</tr>
<tr>
<td>Secondary education</td>
<td>486(45.00)</td>
</tr>
<tr>
<td>Tertiary education or above</td>
<td>539 (49.91%)</td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
</tr>
<tr>
<td>Full-time employed</td>
<td>591(54.72)</td>
</tr>
<tr>
<td>Part-time employed</td>
<td>295(27.31)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>28(2.59)</td>
</tr>
<tr>
<td>Housewives</td>
<td>56(5.19)</td>
</tr>
<tr>
<td>Retired</td>
<td>110(10.19)</td>
</tr>
<tr>
<td>Monthly household income</td>
<td></td>
</tr>
<tr>
<td>≤HKD10000</td>
<td>109(10.09)</td>
</tr>
<tr>
<td>HKD10001–20000</td>
<td>204(18.89)</td>
</tr>
<tr>
<td>HKD20001–30000</td>
<td>206(19.07)</td>
</tr>
<tr>
<td>HKD30001–40000</td>
<td>239(22.13)</td>
</tr>
<tr>
<td>≥HKD40000</td>
<td>322(29.81)</td>
</tr>
</tbody>
</table>
is a 21-item self-report instrument that uses a Likert-type scale from “0=Did not apply to me at all” to “3=Applied to me very much, or most of the time.” Only the anxiety subscale (7 items) was used in the current study. The Chinese instrument version was also found to have high reliability and validity previously [16]. Alpha for the anxiety subscale was 0.79 for our sample.

COVID-19-induced anxiety

The Generalized Anxiety Disorder Scale-7 (GAD-7) assessed anxiety and worry symptoms over the past two weeks [17]. It is a 7-item self-report measure that uses a Likert-type frequency scale from “0=Not at all” to “3=Nearly every day.” The Chinese version was used, which was found to be reliable and valid [18]. We tailored instructions to query COVID-19-induced anxiety, specifying “Over the last two weeks, how often have you been bothered by the following problems because of the coronavirus outbreak?” The alpha for this scale was 0.90 for our sample.

Problematic smartphone use

The Smartphone Addiction Scale-Short Version (SAS-SV) assessed smartphone-related problematic use and functional impairment [19]. It is a 10-item self-report measure, which was developed in Korean and English. The measure uses a Likert-type scale from “1=Strongly disagree” to “6=Strongly agree.” The Chinese SAS-SV was used, which was validated by Luk et al. [20]. The alpha for this scale was 0.89 for our sample.

Analytic plan

Descriptive statistics and Pearson correlation coefficients were computed for major variables using SPSS 26.0. The web survey prompted participants to complete skipped items; thus, no missing item-level data were present. Structural equation modeling (SEM) was used to evaluate the fitness of the hypothesized model in explaining the associations between general anxiety symptoms, COVID-19-induced anxiety, and the severity of PSPU. A two-step approach to SEM was used to examine the hypothesized relationships among the latent variables [21]. A measurement model was examined with confirmatory factor analysis (CFA) to determine whether the factor structure of the variables fits the data. The latent variables of general anxiety symptoms, COVID-19-induced anxiety, and severity of PSPU were indicated by their corresponding items. It was then followed by the mediation model through analyzing the direct and indirect effects among the independent and dependent variables. The goodness-of-fit of the models was evaluated using Chi-square ($\chi^2$) statistics, comparative fit index (CFI), Tucker Lewis Index (TLI), and the root mean square error of approximation (RMSEA). CFI and TLI values above 0.90 indicate acceptable model fit [22]. RMSEA values of 0.06 or less are considered a close model fit [22]. Amos 22.0 was used to analyze the data.

3. Results

Descriptive statistics and correlations among major variables

The skewness and kurtosis statistics did not indicate problems of non-normality among the major variables. As hypothesized, general anxiety was associated with higher COVID-19-induced anxiety ($r=0.44$) and higher PSPU severity ($r=0.36$). COVID-19-induced anxiety was positively associated with PSPU severity ($r=0.30$). The results are summarized in Table 2. We also examined the association between background demographics variables and the major variables of interest (general anxiety, COVID-19-induced anxiety, and PSPU severity). We found that all background variables did not correlate significantly with the major variables of interest.

The validated cut-off scores for each instrument were adopted to identify possible mental health cases. Also, 242 participants (22.41%) were identified with moderate anxiety using a DASS-21 anxiety score >5, with 69 participants (6.38%) with severe anxiety with a score >7. Moreover, 78 participants (7.22%) were identified with moderate COV-

| Table 2. Descriptive statistics and correlations among major variables |
|-----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Variable                    | 1                   | 2                   | Mean±SD             | Skewness            | Kurtosis            |
| General Anxiety             | -                   | 4.01±3.32           | 0.56                | -0.18              | 0.79                |
| COVID-19 Anxiety            | 0.44**              | -                   | 4.51±4.12           | 0.13                | -0.39              | 0.90                |
| PSPU Severity               | 0.36**              | 0.30**              | 31.90±10.32         | -0.27              | -0.25              | 0.89                |

*p<0.05, **p<0.01

ID-19-induced anxiety using a GAD-7 score >9, with 25 cases (2.31%) of severe COVID-19-induced anxiety using a score >14. Finally, 516 participants (47.78%) were identified with PSPU using a SAS-SV score >31.

**Latent variable measurement models**

Three measurement models for latent variables were individually constructed and evaluated by CFA. The results are summarized in Figure 1. The latent variables for general anxiety symptoms, COVID-19-induced anxiety, and PSPU severity were respectively constructed by seven items, seven items, and ten items from the measurement scales. For independent variables, the measurement model for the DASS-21 anxiety subscale had a satisfactory fit ($\chi^2 (14)=34.05$, $P<0.001$, CFI=0.98, TLI=0.97, RMSEA=0.05). Additionally, the measurement model for the GAD-7 also had a satisfactory fit ($\chi^2 (14)=24.90$, $P<0.001$, CFI=0.99, TLI=0.98, RMSEA=0.06). For dependent variables, the measurement model for SAS-SV had a sat-

**Figure 1.** Latent variable measurement models for general anxiety, COVID-19-induced anxiety, and PSPU Severity.

Note 1: ANX=Anxiety; C-ANX=COVID-19-related anxiety; PSPU = Problematic smartphone use

Note 2: All factor loadings are significant at $P< 0.001$. 

Figure 2. A mediation model for the relationships among general anxiety, COVID-19-induced anxiety, and PSPU Severity.

Note 1: ANX=Anxiety; C-ANX=COVID-19-related anxiety; PSPU=Problematic smartphone use.

Note 2: Standardized path coefficients were presented.

Note 3: All structural path coefficients were statistically significant at **P<0.001.

Note 4: The coefficients in the parentheses represented the direct path coefficients from general anxiety to PSPU Severity without considering the indirect effects.

The SEM results supported fitness of the hypothesized model in predicting PSPU (χ²(100)=246.44, CFI=0.97, TLI=0.96, RMSEA=0.05), with satisfactory model fit indices. The standardized path coefficients were significant between general anxiety symptoms and COVID-19-induced anxiety (β=0.43, P<0.001) and between COVID-19-induced anxiety and PSPU severity (β=0.29, P<0.001). At the same time, the direct effect from general anxiety and PSPU severity was also significant (β=0.23, P<0.001). The results suggested that individuals with higher general anxiety symptoms tended to report more COVID-19 anxiety and have higher PSPU severity. Those having higher levels of COVID-19-induced anxiety were more likely to report higher PSPU severity. Results from bootstrapping supported the presence of a significant mediation effect. Both the indirect effects from anxiety to PSPU via COVID-19-induced anxiety (β=0.12; 95% CI=0.03, 0.21) and the direct effects from anxiety to PSPU were significant (β=0.36; 95% CI=0.24, 0.47). These results indicated a partial mediation effect of COVID-19-induced anxiety between anxiety and PSPU (Figure 2).

4. Discussion

Our primary findings demonstrated that both general anxiety symptoms and COVID-19-induced anxiety were associated with PSPU severity and COVID-19-induced anxiety mediated relations between predisposing general anxiety with PSPU severity. We found the possible prevalence of at least moderate anxiety in around 22% of participants. These findings roughly correspond to other COVID-19 community estimates, ranging around 20% for moderate anxiety [4, 5]. Consistent with the prior literature [12], the current study found that COVID-19-induced anxiety was associated with PSPU severity in bivariate analyses and the SEM model. The relationship between COVID-19-induced anxiety with PSPU severity fits with the I-PACE conceptualization of responses to environmental stressors driving excessive Internet use to alleviate negative emotion [10]. Previous studies have shown that social isolation particularly influences negative affectivity [23]. Thus, to manage anxiety from COVID-19 and associated social isolation, especially considering home quarantine and the absence of numerous other activities, many people may engage in PSPU.

In our SEM model, when adding and controlling for general anxiety as predictors of PSU severity, COVID-19-induced anxiety still is related to PSU. Thus, while COVID-19-induced anxiety on its own (in SEM) was
significantly related to PSU severity, controlling for general anxiety rendered this significant relationship. Despite significant concerns about COVID-19, people have other everyday life worries and anxiety (captured by our general anxiety assessment) that have not ceased but probably increased with COVID-19-induced anxiety. For example, everyday anxiety involving social and intimate relationship formation and maintenance would naturally exacerbate with home quarantine [3], and increase the fear of missing out on rewarding experiences [13]. Similarly, existing anxiety regarding finances, employment, and economic stability has risen because of the economic toll of the COVID-19 pandemic [2]. Such everyday anxieties, exacerbated because of the outbreak, may supersede COVID-19-induced anxiety, resulting in adverse outcomes, such as PSPU. But, specifically fearing death from COVID-19 (from medical vulnerability, or excessive worry) may especially result in greater PSU severity to alleviate negative emotion, consistent with our findings from bivariate and SEM models.

Our study also found that COVID-19-induced anxiety mediated relations between general anxiety and PSPU severity in our mediation model. The interaction of Person-Affect-Cognition-Execution (I-PACE) model is one of the prominent theoretical frameworks explaining excessive internet and smartphone use. This model conceptualizes major categories of variables influencing excessive internet use, including background predisposing variables and affective and cognitive responses. Therefore, the findings in the current study implied that how individuals respond to environment stressors is crucial on explaining the excessive smartphone use, which is consistent with I-PACE model. [10, 11]. Anxiety and worry are known to cause greater COVID-19-induced anxiety from a viral outbreak, especially among those with health anxiety misinterpreting physical sensations as viral symptoms [24]. Therefore, people with pre-existing anxiety may excessively worry about COVID-19, driving overwhelming demand for medical services [25]. It is implied that achieving the right balance between promoting social distancing, and not excessive worry, is important. Meanwhile, it is plausible that there is a feedback loop, by which people manage their COVID-19-induced anxiety by excessively using their smartphones, but by doing this, they inadvertently learn more about COVID-19 from the news, further fueling their anxiety and increased smartphone use. More frequent social media exposure to COVID-19 has been shown to be positively associated with anxiety symptoms [27]. Second, online self-report scales were used instead of the in-person interview due to the COVID-19 and the quarantine policy from the government. Relatively, structured in-person interviews would be more accurate. Additionally, we used self-reported problematic smartphone use, while future studies could consider adopting the objective measurement, such as experience sampling of the momentary mental health status and smartphone use, which is more accurate [28]. Future directions may also include other psychological outcomes, such as depressive symptoms. Nonetheless, our results provide initial data on the mental health status of people affected by COVID-19, and the relations between COVID-19-induced anxiety and PSPU severity as a coping mechanism. These results provide a foundation from, which we and other researchers can pursue further investigation of the impact of the COVID-19 pandemic on smartphone use generally and in the context of developing strategies to reduce COVID-19-related PSPU.

Limitations and Conclusion

The research reported in our paper has several limitations. First, the data in this study were collected cross-sectionally, and hence, causal interpretations cannot be made. It is plausible that there is a feedback loop, by which people manage their COVID-19-induced anxiety by excessively using their smartphones, but by doing this, they inadvertently learn more about COVID-19 from the news, further fueling their anxiety and increased smartphone use. More frequent social media exposure to COVID-19 has been shown to be positively associated with anxiety symptoms [27]. Second, online self-report scales were used instead of the in-person interview due to the COVID-19 and the quarantine policy from the government. Relatively, structured in-person interviews would be more accurate. Additionally, we used self-reported problematic smartphone use, while future studies could consider adopting the objective measurement, such as experience sampling of the momentary mental health status and smartphone use, which is more accurate [28].

Future directions may also include other psychological outcomes, such as depressive symptoms. Nonetheless, our results provide initial data on the mental health status of people affected by COVID-19, and the relations between COVID-19-induced anxiety and PSPU severity as a coping mechanism. These results provide a foundation from, which we and other researchers can pursue further investigation of the impact of the COVID-19 pandemic on smartphone use generally and in the context of developing strategies to reduce COVID-19-related PSPU.

Ethical Considerations

Compliance with ethical guidelines

Author has complied with American Psychological Association (APA) ethical standards in the treatment of their sample, human or animal, or to describe the details of treatment.
Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflicts of interest

The authors declare that they have no conflict of interest.
مقاله پژوهشی

علاوه اضطراب مربوط به شدت استفاده مشکلزا از گوشی هوشمند، نقش میانجی اضطراب ناشی از کرونا-19

نوره ما

1. گروه جراحی، دانشکده پزشکی، گروه بهداشت چینی هنگ کنگ، چین

مقدمه

کرونا-19، اضطراب استفاده مشکلزا از گوشی هوشمند را در شرایط بیماری و اقتصادی مبتلا به بیماری کرونا در سال 2020 نشان داد. شرکت‌های اینترنتی و اکثر کشورها از تلفن هوشمند استفاده کردند تا اطلاعات بیماری کرونا را دریافت کنند. این استفاده از تلفن هوشمند به طور گسترده افزایش یافت.

در این مطالعه به بررسی علائم اضطراب عمومی و اضطراب ناشی از بیماری کرونا در افراد بزرگسال انجام شد. این مطالعه با مکانیسم مقابله مشکلات روانی کرونا و تأثیر آن بر درد اضطراب تحقیق گردید.

روش‌های اجرایی

با استفاده از نرم‌افزار ساختاری و نسخه گذاری مشکلات ساختاری و نسخه 35، این تغییرات در حوزه اجتماعی و اقتصادی در تاریخ 23 آذر 2020 در مرحله اولیه کم‌ترین بحران بهداشت جهانی در دهه 2020 رخ داد. مطالعه حاضر به بررسی علائم اضطراب عمومی و اضطراب ناشی از بیماری کرونا در افراد بزرگسال انجام شد.

نتایج

نتایج نشان داد که در طول همه مرحله‌های شغلی تأثیر بیماری کرونا و تأثیر آن بر درد اضطراب تحقیق گردید.

مراجع

استفاده به طور مؤثر از فضاهای اجتماعی برای بهبود بهبود و سرمایه اجتماعی را بهبود بخش و افزایش و سرمایه اجتماعی را بالاتر می‌کند. به طور مخصوص، فضاهای اجتماعی برای مقابله با افراد به طور مؤثر استفاده می‌شود.

به طور خاص، این مطالعه شامل آزمون‌های عملکردی در مورد استفاده در اینترنت و چالش‌های روانی ضعیف و روانی قابل توجهی است. به طور کلی، سلامت عمومی به طور مؤثری بهبود می‌یابد.

نتایج این مطالعه نشان می‌دهد که استفاده از فضاهای اجتماعی برای مقابله با استرس و افزایش سلامت روانی مؤثر می‌باشد.

رژه، پرداختن به روابط رسانه‌ای و رابطه معنی‌داری بین فضاهای اجتماعی و سلامت روانی است. این مطالعه نشان می‌دهد که استفاده به طور مؤثر از فضاهای اجتماعی برای مقابله با استرس و افزایش سلامت روانی مؤثر می‌باشد.

پس از تایید کمیتی اخلاقی مختلف، یک نظرسنجی مقطعی در مراجعه به بخش مورد نظر در سال 2007 صورت گرفت. این مطالعه نشان می‌دهد که استفاده به طور مؤثر از فضاهای اجتماعی برای مقابله با استرس و افزایش سلامت روانی مؤثر می‌باشد.
از گوپیوئس 121 تا بهینه شدن و پاسخ به این پرسش مشخص است. هر دو هفته گشته شده باید به دلیل شیوع ویروس کرونا مشکلات و احساساتی که از آن آزار است، آنفراخورد لازم به دردسر می‌باشد. چون هر فرد که بالاخره گزارش به دنبال خروج از محدودیت های دردسری می‌گردد، یک تا پیشینه جزئی از 2019 واقع در چم هزار دلار (20/2 دلار از 20/2 هزار دلار) تا بیش از چهلم هزار دلار (20/2 دلار از 20/2 هزار دلار) تا بیش از چهلم هزار دلار (20/2 دلار از 20/2 هزار دلار) تا بیش از چهلم هزار دلار (20/2 دلار از 20/2 هزار دلار) لازم است.

استفاده مشکل‌زا از گوشی هوشمند

مقیاس فرم کوتاه اعتیاد به گوشی هوشمند استفاده شده دومیکاری کرد [11] و این نیاز به بررسی دانسته‌های مربوط به گوشی هوشمند و آنالیز بانک مربوط به داده‌های کاهش مصرف هوشمند از محبوب در سه خانه در سال 20001 نشان داد. همچنین برای بهبودی فرآیند بازخوری مشکلات هوشمند، انجام روش رفت‌وآمد داده‌های مربوط به دانسته‌های هوشمند استفاده می‌گردد. روش‌های داده‌های معقول، موانع و آماری تحلیلی معنی‌دار، مسائل، روانی، روانی و انسانی می‌باشد. نتایج در جدول شماره 1 مشخص شده است.

ظرف تحقیق

آمار توصیفی و ضریب همبستگی پیرسون برای متغیرهای اصلی با استفاده از نرم‌افزار SPSS محاسبه‌شده. نتایج این مقیاس از نظر اینکه آیا همبودی با سیزده بیماری مزمن پزشکی ویروسی کرونا با وجود مشکلات و مشکلات شناختی و کاهش رفت‌وآمد در سطح آیتم وجود نداشت.

13. Root Mean Square Error of Approximation (RMSEA)
12. Chi-square
11. Comparative Fit Index (CFI)
10. Tucker Lewis Index (TLI)
9. Confirmatory Factor Analysis (CFA)
8. Structural Equation Modeling (SEM)
7. Smartphone Addiction Scale-Short Version (SSV-
6. Depression Anxiety Stress Scale-21 (DASS-21)
5. Generalized Anxiety Disorder Scale-7 (GAD-7)
4. Depression Anxiety Stress Scale-21 (DASS-21)
3. Confirmatory Factor Analysis (CFA)
2. Structural Equation Modeling (SEM)
1. Smartphone Addiction Scale-Short Version (SSV-

سلامت روان انتخاب شد و ۱۴۳۴ نفر شرکت کرده‌اند. در این سطح، پایداری متوسط با نمره اضطراب عمومی و اضطراب ناشی از کووید-۱۹ نشان داده شد. همچنین، در جدول شماره ۲ خلاصه شده است. در این مطالعه ارتباط بین متغیرهای جمعیت‌شناسی و اضطراب عمومی، اضطراب ناشی از کووید-۱۹ و شدت استفاده مبتنی بر مدت استفاده از گوشی هوشمند مورد بررسی قرار گرفت. در این مطالعه، همه متغیرهای پس‌زمینه با متغیرهای اصلی مورد مطالعه می‌بایست معنی‌داری داشته باشند.

### جدول ۱

<table>
<thead>
<tr>
<th>متغیر</th>
<th>نمرات برش معتبر برای ابزار انتخاب شده</th>
<th>۲۰۴۲</th>
<th>۱۸۹</th>
<th>۲۰۰۰۱</th>
<th>۲۰۰۰۱–۲۰۰۰۱‌۰۰۰۰</th>
<th>≥HKD۴۰۰۰۱۰۰۰۱</th>
<th>≥HKD۴۰۰۰۱۰۰۰۱</th>
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<tr>
<td>علائم اضطراب عمومی</td>
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<td>۲۰۰۰۱–۲۰۰۰۱‌۰۰۰۰</td>
<td>≥HKD۴۰۰۰۱۰۰۰۱</td>
<td>≥HKD۴۰۰۰۱۰۰۰۱</td>
<td></td>
</tr>
<tr>
<td>شدت استفاده</td>
<td>۲۰۴۲</td>
<td>۱۸۹</td>
<td>۲۰۰۰۱</td>
<td>۲۰۰۰۱–۲۰۰۰۱‌۰۰۰۰</td>
<td>≥HKD۴۰۰۰۱۰۰۰۱</td>
<td>≥HKD۴۰۰۰۱۰۰۰۱</td>
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<tr>
<td>گوشی هوشمند</td>
<td>۲۰۴۲</td>
<td>۱۸۹</td>
<td>۲۰۰۰۱</td>
<td>۲۰۰۰۱–۲۰۰۰۱‌۰۰۰۰</td>
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<td>≥HKD۴۰۰۰۱۰۰۰۱</td>
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<tr>
<td>وضعیت م بالأکر</td>
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<td>۱۸۹</td>
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<td>۲۰۴۲</td>
<td>۱۸۹</td>
<td>۲۰۰۰۱</td>
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</tr>
</tbody>
</table>

## نتایج

آمار چولگی و کشیدگی نشان دهنده مشکل غیرعادی بودن در بین متغیرهای اصلی نیست. همان‌طور که در سطح استفاده عمومی با اضطراب پیشتر ناشی از کووید-۱۹ (r=0.44) و شدت بالای استفاده مشکل‌زا از گوشی هوشمند (r=0.41) مرتبط بود اضطراب ناشی از کووید-۱۹ با استفاده از گوشی هوشمند ارتباط مثبت داشت. همچنین، اضطراب عمومی، اضطراب ناشی از کووید-۱۹ و شدت استفاده با هر یک از متغیرهای پس‌زمینه دارای استفاده مشکل‌زا از گوشی هوشمند با استفاده از نمره بالاتر از گوشی هوشمند (r=0.02) مرتبط نبود. نتایج نشان داد که در جدول شماره ۲ خلاصه شده است. در این مطالعه ارتباط بین متغیرهای جمعیت‌شناسی و اضطراب عمومی، اضطراب ناشی از کووید-۱۹ و شدت استفاده مبتنی بر مدت استفاده از گوشی هوشمند مورد بررسی قرار گرفت. در این مطالعه، همه متغیرهای پس‌زمینه با متغیرهای اصلی مورد مطالعه می‌بایست معنی‌داری داشته باشند.

### نتایج

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</tr>
</thead>
</table>
چهارم آمار توصیفی و همبستگی بین متغیرهای اصلی

<table>
<thead>
<tr>
<th>متغیر</th>
<th>کشیدگی</th>
<th>چولگی</th>
<th>میانگین ± انحراف معیار (2)</th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>استرس عمومی</td>
<td>0/86</td>
<td>0/00</td>
<td>0/18 ± 0/00</td>
<td>0/6/0/32</td>
</tr>
<tr>
<td>استرس کووید</td>
<td>0/37</td>
<td>0/00</td>
<td>0/00 ± 0/00</td>
<td>0/30/0/36</td>
</tr>
<tr>
<td>شدت استفاده مشکل از گوشی هوشمند</td>
<td>0/4/0/18</td>
<td>0/00</td>
<td>0/00 ± 0/00</td>
<td>0/0/0</td>
</tr>
</tbody>
</table>

توضیحات:

انکار 1: اضطراب عمومی = ANX
انکار 2: اضطراب ناشی از کووید = C-AND
انکار 3: استفاده مشکل از گوشی هوشمند = PSUS

هر باره عاملی در p < 0.001 معنی‌دار است.
متغیره و مدل مدل سازی معادلات ساختاری کنندگان مشاهده شد. از تلفن های اولیه این مطالعه نشان داد هم علائم اضطراب عمومی بین اضطراب و هم اثرات زا از تلفن هوشمند از طریق اضطراب عمومی تا شدت استفاده مشکل زا از تلفن هوشمند بدون ممکن بود نظر گرفتن اثرات غیرمستقیم است.

14. Bootstrapping
مطابق با یافته‌های پژوهش‌های قبلی در مورد تأثیر نشریات در بیماری‌های نوری امروز، تحقیقات نشان داده‌اند که امروزه اضطراب عمومی به‌طور کلی و در بیش‌ترین موارد از عوامل مهمی که باعث ایجاد استرس و اضطراب در افراد مبتلا به کووید-۱۹ گردیده است. این مطالعات نشان داده‌اند که افزایش استفاده از تلفن‌های هوشمند به عنوان یک طرح درمانی در زمینه بهبود اضطراب و نگرانی در هنگام بیماری کووید-۱۹ وجود دارد. این احتمال وجود دارد که یک حلقه بازخورد وجود داشته باشد که تاکیدی در این مقاله داشته‌اند.

به‌عنوان یک مکانیسم اولیه در مورد وضعیت سلامت روان افراد شناختی مانند علائم افسردگی نیز باشد. با این حال، نتایج گیری تجربه از وضعیت سلامت افراد در طول مدت کووید-۱۹ نشان‌دهنده گزارش معنی‌داری از میزان استرس و نگرانی در این زمینه بوده است. این نتایج نشان‌دهنده‌ای از امکان‌یافتن استرس این افراد در هنگام بیماری کووید-۱۹ می‌باشد.

نتایج اهمیت بخشی از استرس و نگرانی در این زمینه بوده، به‌ویژه در افرادی که به‌طور طبیعی با قرنطینه خانگی و عدم وجود فعالیت اجتماعی، منجر به استرس و نگرانی هستند. در همین حال، اگر این افراد به‌طور ناخواسته با بیش از حد ارتباط به سایر افراد از طریق استفاده از تلفن‌های هوشمند، این احتمال وجود دارد که تأثیرات منفی این ارتباط باعث شود که بیش از حد استرس و نگرانی در این افراد ایجاد شود.

به‌عنوان یک نتیجه‌گیری، در این مقاله نشان داده شده است که امروزه اضطراب عمومی به‌طور کلی و در بیش‌ترین موارد از عوامل مهمی که باعث ایجاد استرس و اضطراب در افراد مبتلا به کووید-۱۹ گردیده است. این مطالعات نشان داده‌اند که افزایش استفاده از تلفن‌های هوشمند به عنوان یک طرح درمانی در زمینه بهبود اضطراب و نگرانی در هنگام بیماری کووید-۱۹ وجود دارد. این احتمال وجود دارد که یک حلقه بازخورد وجود داشته باشد که تاکیدی در این مقاله داشته‌اند.

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چارچوب توسعه استراتژی‌های پیش‌بینی کمک استفاده مشکل‌زا
از تلفن هوشمند مرتبط با کووید-19 دنبال کنیم.

ملاحظات اخلاقی

نویسنده استاداندیه‌ای اخلاقی انجمن روان‌شناسی آمریکا14 را
در درمان نمونه‌های خود انسان با حیوان، یا برای توصیف جرایب
درمان رعایت کرده است.

حامی مالی

این پژوهش هیچ‌گونه کمک مالی از سازمان‌های دولتی،
خصوصی و غیرانتفاعی دریافت نکرده است.

تعارض منافع

بیان اظهار نویسنده این مقاله تعارض مالی ندارد.

15. American Psychological Association (APA)
outbreak. Plos One. 2020; 15:e0231924. [DOI:10.1371/journal.pone.0231924] [PMID] [PMCID]

