A Study on the Nostalgia effect of Dance for All Participants during the COVID-19 Pandemic

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Research Article

**Keywords:** COVID-19 pandemic, Dance for all (DFA), Dance for all participants (DFAP's), Nostalgia, Cognitive Emotion Regulation (CER), Coping Flexibility (CF), Resilience, Participation Continuance Intention (PCI)

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Abstract

**Background:** The purpose of this study is to examine the effect of participants' nostalgia for the before COVID-19 DFA experience on their future participation continuation intention. To achieve this purpose, nostalgia, cognitive emotion regulation (CER), coping flexibility (CF), resilience, and participation continuance intention (PCI) were set as major variables and the structural influence relationship between them was explored.

**Methods:** A survey was conducted on 557 “dance for all” participants (DFAP’s) who joined public sports facilities, academies, and clubs in Seoul and Gyeonggi Province in South Korea. Data analysis was performed on Windows PC/SPSS 26.0 and AMOS 24.0 ver. frequency analysis, correlation analysis, confirmatory factor analysis and structural equation modeling were used to analyze the survey results.

**Results:** First, all sub-factors of the nostalgia of DFAP's has a statistically significant effect on CER. Second, CER of DFAP's has a statistically significant effect on CF. Third, CER of DFAP's does not have a statistically significant effect on resilience. Fourth, CF and resilience of DFAP's has a statistically significant effect on PCI.

**Conclusions:** Therefore, this study's novelty is that it provides practical implications for the application of nostalgia as an alternative to satisfying the desire to participate in physical activities such as DFA during the “post COVID-19” era.

1. Introduction

After the WHO declared a “COVID-19 Pandemic” in March 2020, the world was faced with an unprecedented and complex crisis, spreading anxiety and fear. As COVID-19 has been prolonged, our daily lives have been restricted with the result that in addition to physical symptoms such as fatigue and lethargy, psychological symptoms such as stress, depression, and anxiety explode into annoyance and anger. In the early days of COVID-19, potential anxiety and fear of a new disease were the main emotions, but as the long-term spread continued, it expanded to stress overload and anger [1].

According to a recent OECD study (2021) [2], on the impact of Corona 19 on mental health, the number of people with depression and anxiety disorders in major OECD countries (15 countries) has increased by more than three times (Depression level 6.8%→21.8%, anxiety level 8.4%→28.0%) on average (Fig. 1). In addition, when we checked Google search history prior to the COVID-19 lockdown, searches for suicide anxiety, negative thoughts, and sleep disorders significantly increased [3]. As such, it can be seen that the severance of ‘relationships’ and ‘communication’ in daily life due to COVID-19 has a great impact on individual happiness and well-being.

In this situation, people instinctively form a series of emotional changes, or nostalgia, in which they miss and reminisce about their daily lives before COVID-19. Nostalgia is an emotional longing for the past or a strong attachment [5] to miss the past, which usually appears when there is vague anxiety and worry.
about the future when one cannot adapt to the present situation [6]. Among those who felt lonely after the pandemic, those who experienced nostalgia had decrease of happiness was low than those who did not [7], and in a situation where mortality salience is high, nostalgia plays a role in reducing thoughts of death and loneliness by restoring social connectedness [8–9]. This means that nostalgia presupposes a difficult situation such as COVID-19 and acts as an important psychological factor that helps overcome it. In particular, nostalgia is closely related to social experience because it forms feelings about the past through the five human senses (sight, hearing, touch, taste, and smell) [10]. Looking at previous studies related to this, they are mainly limited to studies related to advertisements [11–12], studies on purchase intentions [13], studies on viewing intentions [14], and studies on behavior types [15], and studies on the relationship and continuity of nostalgia, physical activity, and mental health is markedly lacking.

In this context, DFA is a physical activity that uses the human five senses, and it is appropriate to apply the concept of nostalgia because it allows the emotions suppressed inside to be freely expressed through the body, and natural social relationships are formed in the process. DFA is a physical activity that aims to improve welfare by enhancing individual health, aesthetic education, and quality of life through the concepts of “social dance” and “popular dance”. It is also a useful leisure activity that can easily be enjoyed by people of all ages, and is a source of healthy physical training, beauty enhancement, confidence, self-regard, and authentication of others, and is highly effective in relieving the stress caused by COVID-19 [16].

Nevertheless, the physical activity experience of the participants was limited due to the closure of the physical activity space where people were concentrated in the same space due to the spread of Corona 19 infection, making face-to-face activities difficult. As a result, the life dance field, which was based on face-to-face contact in a closed space, faced a serious economic crisis, and participants predicted that due to restrictions on physical activities, they would highly recognize the nostalgia of DFA participated before COVID-19. In other words, it is time to make efforts to minimize the mental health side effects that occur in the COVID-19 situation through physical activity.

Therefore, the purpose of this study is to examine the effect of participants’ nostalgia for the before COVID-19 DFA experience on their future participation continuation intention. To achieve this purpose, nostalgia, cognitive emotion regulation (CER), coping flexibility (CF), resilience, and participation continuance intention (PCI) were set as major variables and the structural influence relationship between them was explored.

Therefore, this study’s novelty is that it provides practical implications for the application of nostalgia as an alternative to satisfying the desire to participate in physical activities such as DFA during the “post COVID-19” era.

2. Conceptual Background And Hypothesis Setting
2.1. The relationship between SA (social aspect) and CER (cognitive emotion regulation)

SA is when humans feel nostalgia from social experiences in the past [17–18]. In other words, the theory is established that nostalgia can be maximized whenever one thinks of interpersonal relationships such as leaders, partners, and fellow participants who form social experiences through DFA. Cho [19] revealed that university students can flexibly control their emotions about stress when they experience a sense of belonging. In addition, Cho [20] reported that they felt high emotional stability and comfort when participating in DFA with fellow participants, and Hong & Hong [21] also reported that support for interpersonal relationships can increase cognitive emotional regulation.

2.2. The relationship between ME (Memorable Event) and CER (cognitive emotion regulation)

ME is feeling nostalgia through surprising experiences that we do not experience in our daily lives or events that cause emotional awakening [22]. Cialdini [23] defined it as the 'Law of scarcity', which states that psychologically people attach higher value to rare things that are difficult to experience than to everyday things that happen frequently and remember them for a long time. In other words, in DFA, the moment of complete immersion in performance and physical activity of physical activity, and the moment of feeling that the skill of physical activity has improved correspond to ME. Holak & Havlena's [17] study, it was found that in the process of remembering past experiences, a positive emotional response of pleasure was generally shown, and Wildschut et al. [24] demonstrated that stimulating the experience of nostalgia for specific situations appears as a positive evaluation as a function of cognitive emotion regulation.

2.3. The relationship between SI (Sensory Inputs) and CER (cognitive emotion regulation)

SI is to feel the nostalgia that is formed through the experience of human five senses [24]. Humans accept phenomena through sensory experiences, which are stored in the brain as experiences and become factors that stimulate nostalgia. In other words, sensory experiences in DFA are nostalgic experiences perceived through sight, hearing, touch, taste, and smell through physical activities. Bass [25] reported a study result that the sensory experience of physical activity and emotion are positively correlated, and Lee [26] said that participation experience of DFA gives a positive synergistic effect in terms of physical, psychological, and social aspects.

2.4. The relationship between CER (cognitive emotion regulation) and CF (coping flexibility)

CER is a concept to explain the individual's unique coping ability to cognitively deal with negative emotions caused by the COVID-19 situation [27]. Ciccogetti et al. [28] explained that emotion regulation is an essential process in preventing maladaptive behaviors after an individual's stressful experience, and
Garnefski et al. [29] explained that through cognitive processes Emotional regulation reported a study result that changes the property of emotional experience itself or reduces or strengthens the intensity of emotional experience during stressful events to CF.

### 2.5. The relationship between CER (cognitive emotion regulation) and Resilience

Regarding the effect of CER on mental health, Linehan [30] reported a study result that the lower the tolerance for emotional pain and the ability to regulate emotions, the more suicidal-like behaviors appear. In addition, when resilience is high, cognitive emotion regulation ability to respond flexibly by perceiving the situation as controllable and devising alternative explanations and solutions for the incident is also high [31–32].

### 2.6. The relationship between CF (coping flexibility) and PCI (participation continuance Intention)

CF is an individual's attempt to maintain a psychologically stable state, and refers to cognitive and behavioral efforts that appropriately control the interaction between the individual and the environment [33]. In other words, if efforts to lower an individual's psychological anxiety or stress level in the COVID-19 situation, that is, coping behaviors work well, it can be of practical help in overcoming the current situation [34]. Chang & Lee [35] revealed that leisure sports participants with high coping flexibility gained psychological comfort by establishing social relationships with people through continued physical activity participation even in situations where physical activity was restricted due to COVID-19. Also, Lesser & Nienhuis [36] and Stanton et al. [37] revealed that people with high flexibility in coping with stressful situations before COVID-19 participate in physical activities more actively after COVID-19.

### 2.7. The relationship between Resilience and PCI (participation continuance Intention)

Resilience is a phenomenon of adapting with a positive attitude by effectively coping with situations that hinder psychological well-being due to COVID-19. Masten [39] suggested that resilience is an approach for athletes to positively solve situations when faced with stressful situations or adversity, and Fischbacher [40] suggested that resilience is reported a study result that it had a positive effect on improving the performance of the students and enhancing the motivation that led to successful exercise performance. This is the basis for establishing the hypothesis that resilience will have a positive effect on the continuous physical activity of athletes.

### 2.8. Hypothesis setting and research model

Based on the results of previous studies, the following hypotheses and models were established [Figs. 2].

H1-1: The SA, a sub-factor of nostalgia will have a significant effect CER.

H1-2: The ME, a sub-factor of nostalgia will have a significant effect CER.
H1-3: The SI, a sub-factor of nostalgia will have a significant effect CER.

H2-1: The CER, will have a significant effect CF.

H2-2: The CER, will have a significant effect resilience.

H3: The CF, will have a significant effect on their PCI.

H4: The resilience, will have a significant effect on their PCI.

3. Methods

3.1. Participants

In 2021, the Ministry of Culture, Sports and Tourism of South Korea, Seoul published the National Sports for all Participation Status which stated that Seoul and the Gyeonggi-do region had the highest number of sports club members out of 17 cities and provinces nationwide [41]. Based on this, 557 DFAP’s who had joined public sports facilities, private academies, and clubs in the city or region area were judged to reflect the various personal characteristics of the research participants and were selected as the sample group. The sample size is the number of completion responses that you receive in the survey, which is called a sample because it represents only a part of a group of people, and you want to know their opinions or behavior [42]

A survey designed to measure the nostalgia, CER, CF, Resilience, and PCI of DFAP’s was conducted. Participants were limited to those who had continuously participated in DFA before the COVID-19 pandemic. To identify participants, the purposive sampling method used among nonprobability sampling (random sample), and the participants used the self-administration method where they completed the questionnaire and then handed it directly back to the researcher. To increase the understanding and reliability of the survey, researchers visited the site directly and conducted a face-to-face survey in which the questionnaire was is tributed and retrieved. All participants provided informed consent and this research was approved by the Institutional Ethics Review Committee of Gangneung-Wonju National University and complied with research ethics. Committee of Gangneung-Wonju National University and complied with research ethics. Committee of Gangneung-Wonju National University and complied with research ethics. Questionnaires was distributed to a total of 557 participants, and 524 questionnaires were selected and analyzed as final valid samples, excluding 33 that provided incomplete answers such as missing entries, double entries, and biased entries (Table 1).

Looking at the demographic characteristics of the participants, 59.9% of ‘female’ was higher than 40.1% of ‘male’. In terms of age, ‘20s’ showed the highest rate among the total participants at 26.7%, while ‘over 50s’ participants showed the lowest at 14.3%. The DFA in which all Participation field the most was ‘K-POP dance’ with 33.0%, and the participation frequency was highest in ‘every other week’ with 38.9%
Table 1
Demographic characteristic of participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>Classification</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>210</td>
<td>40.1</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>314</td>
<td>59.9</td>
</tr>
<tr>
<td>Age</td>
<td>10 s</td>
<td>110</td>
<td>20.9</td>
</tr>
<tr>
<td></td>
<td>20 s</td>
<td>140</td>
<td>26.7</td>
</tr>
<tr>
<td></td>
<td>30 s</td>
<td>105</td>
<td>20.1</td>
</tr>
<tr>
<td></td>
<td>40 s</td>
<td>94</td>
<td>18.0</td>
</tr>
<tr>
<td></td>
<td>Over 50</td>
<td>75</td>
<td>14.3</td>
</tr>
<tr>
<td>Participation field</td>
<td>Art dance</td>
<td>85</td>
<td>16.2</td>
</tr>
<tr>
<td></td>
<td>(Korean dance, ballet, modern dance)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dance sports</td>
<td>124</td>
<td>23.7</td>
</tr>
<tr>
<td></td>
<td>Line dance</td>
<td>142</td>
<td>27.1</td>
</tr>
<tr>
<td></td>
<td>K-POP dance</td>
<td>173</td>
<td>33.0</td>
</tr>
<tr>
<td>Participation frequency</td>
<td>Every week</td>
<td>170</td>
<td>32.4</td>
</tr>
<tr>
<td></td>
<td>Every other week</td>
<td>204</td>
<td>38.9</td>
</tr>
<tr>
<td></td>
<td>Every three weeks</td>
<td>78</td>
<td>15.0</td>
</tr>
<tr>
<td></td>
<td>Once a month</td>
<td>72</td>
<td>13.7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>524</td>
<td>100</td>
</tr>
</tbody>
</table>

3.2. Measurement tool

This study used a questionnaire that consisted of questions used and verified through previous studies. The questions for measuring the nostalgia of DFAP’s were based on the scale developed by Batcho [43] and reused by Hyun & Jun [44] were modified and supplemented to match the purpose and subject of this research. The detailed measurement questions consisted of four items about SA, four items about ME, three items about SI. The questions that CER for DFAP’s considered of four items by based on the cognitive emotion regulation questionnaire scale developed by Garnefski [45] modified and supplemented to match the purpose and subject of this research. The questions to measure COVID-19 CF and resilience were composed of three items developed by Vriezekolk et al. [46] and four items based on Luthans's scale [47], modified and supplemented to match the purpose and subject of this research. Also, questions for measuring the PCI of DFAP’s were based on the scale used three items by Choi [48] modified and supplemented to match the purpose and subject of this research. All questions, except for the
Demographic characteristic of participants, were measured using a 5-point Likert scale (1 = not at all, 5 = strongly agree).

3.3. Validity and Reliability of Measuring

A group of five experts, consisting of a professor in Sports Pedagogics, DFA (dance for all) professor, Sport Pedagogics Ph.D., and DFA Ph.D, verified the validity of the questionnaire's contents. The content validity verification is conducted to confirm the appropriateness and representativeness of the question, and to verify whether each question is appropriate for the evaluation of the purpose as well as whether the content of the question faithfully represents the content to be measured [49]. In addition, a confirmation factor analysis (CFA) was performed to present the contents of the questionnaire and to verify the discriminant validity thereof (Table 2) using the AMOS program, which was also used to implement the structural equation model. The number of factors and the measurement variables comprising them are specified prior to analysis based on prior studies. Therefore, in the CFA, it was assumed that specific measurement variables are necessarily affected only by related factors and are not related to other factors based on strong theoretical background or previous research. In other words, confirmatory factor analysis can verify the discriminant validity that the correlation with other variables except for the measurement variable should be low [50].
Table 2
Confirmatory factor analysis.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Classification</th>
<th>$SC$</th>
<th>$SE$</th>
<th>$t$</th>
<th>C.R</th>
<th>Cronbach's $\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Aspect (SA)</td>
<td>I often see photos or videos of activities where I participated in DFA before COVID-19.</td>
<td>0.674</td>
<td>-</td>
<td>-</td>
<td>0.860</td>
<td>0.872</td>
</tr>
<tr>
<td></td>
<td>I miss the people who participated in DFA together before COVID-19.</td>
<td>0.839</td>
<td>0.080</td>
<td>16.863</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I miss the sense of belonging through participation in DFA before COVID-19.</td>
<td>0.896</td>
<td>0.087</td>
<td>17.676</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I still remember the moment when I first participated in DFA before COVID-19.</td>
<td>0.751</td>
<td>0.077</td>
<td>15.357</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memorable Event (ME)</td>
<td>I often think of moments when I enjoyed participating in DFA before COVID-19.</td>
<td>0.891</td>
<td>-</td>
<td>-</td>
<td>0.896</td>
<td>0.890</td>
</tr>
<tr>
<td></td>
<td>I often think of the physical activities when I participated in DFA before COVID-19.</td>
<td>0.828</td>
<td>0.033</td>
<td>23.877</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I often think of places where I participated the place DFA COVID-19.</td>
<td>0.764</td>
<td>0.037</td>
<td>21.067</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I have worn the props I wore when I participating in DFA before COVID-19.</td>
<td>0.801</td>
<td>0.032</td>
<td>22.668</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensory Inputs (SI)</td>
<td>I often listen to the music heard when I participating in DFA before COVID-19.</td>
<td>0.756</td>
<td>-</td>
<td>-</td>
<td>0.835</td>
<td>0.818</td>
</tr>
<tr>
<td></td>
<td>I can't forget the aesthetic feeling I experienced through DFA activities before COVID-19.</td>
<td>0.781</td>
<td>0.070</td>
<td>18.044</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I often look for content related to DFA.</td>
<td>0.798</td>
<td>0.063</td>
<td>18.484</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Emotion Regulation (CER)</td>
<td>I try to think of other fun things instead of what happened with COVID-19.</td>
<td>0.799</td>
<td>-</td>
<td>-</td>
<td>0.902</td>
<td>0.901</td>
</tr>
<tr>
<td></td>
<td>I think the outbreak of COVID-19 is unavoidable.</td>
<td>0.875</td>
<td>0.051</td>
<td>24.455</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I think there are lessons to be learned from the outbreak of COVID-19.</td>
<td>0.850</td>
<td>0.046</td>
<td>22.268</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variables</td>
<td>Classification</td>
<td>SC</td>
<td>SE</td>
<td>t</td>
<td>C.R</td>
<td>Cronbach's α</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------------------------------------------</td>
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<td>------</td>
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<td>--------------</td>
</tr>
<tr>
<td></td>
<td>I accept the COVID-19 situation as it is.</td>
<td>0.820</td>
<td>0.051</td>
<td>21.250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coping Flexibility</td>
<td>I am fully thinking about ways to deal with the problems that may arise due to COVID-19.</td>
<td>0.895</td>
<td>-</td>
<td>-</td>
<td>0.885</td>
<td>0.894</td>
</tr>
<tr>
<td></td>
<td>I think well about how to respond appropriately to the changed circumstances caused by COVID-19.</td>
<td>0.877</td>
<td>0.036</td>
<td>28.281</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If the way I deal with the COVID-19 situation is not successful, I think of other ways.</td>
<td>0.822</td>
<td>0.044</td>
<td>24.978</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resilience</td>
<td>Even if I face difficulties in my DFA, I can overcome them quickly.</td>
<td>0.886</td>
<td>-</td>
<td>-</td>
<td>0.902</td>
<td>0.914</td>
</tr>
<tr>
<td></td>
<td>I can withstand difficult 0.756 0.904 0.875 situations without any problems</td>
<td>0.815</td>
<td>0.033</td>
<td>24.455</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Even if there is a problem in daily life, it will be easily solved feel.</td>
<td>0.842</td>
<td>0.035</td>
<td>25.963</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Even if I feel frustrated in my daily life, I can shake it off and recover.</td>
<td>0.868</td>
<td>0.035</td>
<td>27.542</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation Continuance Intention</td>
<td>When the corona situation is stable, I will spend time and participate in DFA.</td>
<td>0.852</td>
<td>-</td>
<td>-</td>
<td>0.922</td>
<td>0.889</td>
</tr>
<tr>
<td></td>
<td>I will continue to participate in DFA once the COVID-19 situation is stabilized.</td>
<td>0.876</td>
<td>0.041</td>
<td>24.399</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>When the COVID-19 situation stabilizes, I will recommend people around me to participate in DFA.</td>
<td>0.835</td>
<td>0.041</td>
<td>22.928</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\chi^2=678.414(df=254, p=.000)$, CFI = 0.958, NFI = 0.934, TLI = 0.950, RMR = 0.038, RMSEA = 0.057

According to Bagozzi and Dholakia [51], the best model was evaluated when CFI, NFI, and TLI were 0.8 ~ 0.9 or more, and RMR and RMSEA were 0.05 or 0.08 or less. As a result of conducting confirmatory factor analysis based on this rationale, the model fit of this study was $\chi^2 = 678.414$, df = 254, CFI = 0.958, NFI = 0.934, TLI = 0.950, RMR = 0.038, and RMSEA = 0.057 which satisfies the acceptance level suggested by Bagozzi and Dholakia indicating that it is a relatively good model. Also, the construct reliability (C.R) of
all variables was 0.835 ~ 0.922 indicating that the fit criteria suggested were (eigen value > 0.5, C.R > 0.7). Each variable was found to have concentrated validity by satisfying the values. Kim [49] explained that there was no problem with reliability if the alpha coefficient is .5 or more when the reliability test was carried out for all questions. As a result of using the internal consistency reliability analysis method with Cronbach's $\alpha$ value for reliability verification, it was found that Cronbach's $\alpha$ value was 0.818–0.914 with relatively high reliability.

### 3.4. Data analysis process

The questionnaire used for the final analysis was the result of a data analysis using Windows PC/SPSS 26.0 ver. and AMOS 24.0 ver. after coding and error reviews. First, the general characteristics of the study participants were analyzed using a frequency analysis. Second, confirmatory factor analysis was performed to verify all factors, and reliability was verified by calculating the Cronbach's $\alpha$ coefficient to ensure internal consistency reliability. Third, correlation analysis was performed to analyze the relationship between variables, and structural equation modeling (SEM) was performed to derive a structural model.

### 4. Results

#### 4.1. Correlation analysis

The correlation was analyzed to confirm the correlation between each variable. As a result of the correlation analysis between each variable, it was found that there was no multicollinearity problem because no variable showed a correlation of .8 or higher in the range of the correlation coefficient value [52] of 0.213 to 0.779 (Table 3).

**Table 3. Correlation analysis**
Also, Fornel & Larcker [53] suggested that discriminant validity can be secured if the AVE value is larger than the squared value of the correlation coefficient the largest square value of the correlation coefficient was 0.779 (= 0.607), and the smallest value of AVE was .680, ensuring discriminant validity.

### 4.2. Model verification

The results of the analysis verified the suitability of the structural model established in this research: $\chi^2 = 738.819$, $df = 261$, CFI = 0.962, NFI = 0.929, TLI = 0.945, RMR = 0.062, and RMSEA = 0.059. According to Kline [54], when the indicators of CFI, NFI, and TLI, which generally evaluate the overall fit of a model, are above 0.8 to 0.9, RMR and RMSEA are evaluated as a good model when they are less 0.08 [24]. Therefore, it was confirmed that this research model explains the research hypothesis and empirical dataset as a suitable model for adoption relatively well (Table 4).

<table>
<thead>
<tr>
<th>A construct</th>
<th>$\chi^2$</th>
<th>$df$</th>
<th>$P$</th>
<th>CFI</th>
<th>NFI</th>
<th>TLI</th>
<th>RMR</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptance level</td>
<td>738.819</td>
<td>261</td>
<td>0.000</td>
<td>0.962</td>
<td>0.929</td>
<td>0.945</td>
<td>0.062</td>
<td>0.059</td>
</tr>
</tbody>
</table>

### 4.3. Hypothesis testing

Based on the results of the testing analysis, all hypotheses of H1-1 ($\beta = .248$, $t = 7.963$), H1-2 ($\beta = 0.095$, $t = 3.098$), H1-3 ($\beta = 0.842$, $t = 16.317$), H2-1 ($\beta = 0.919$, $t = 16.851$), H2-2 ($\beta = 0.954$, $t = 15.901$), H3 ($\beta =$
0.246, \( t = 4.645 \), and H4 (\( \beta = 0.798, \ t = 7.964 \)) was accepted (Table 5), [Figs. 3].

<table>
<thead>
<tr>
<th>H</th>
<th>Path</th>
<th>( SE )</th>
<th>CR</th>
<th>( p )</th>
<th>Accept/Reject</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1-1</td>
<td>SA → CER</td>
<td>0.248</td>
<td>0.031</td>
<td>7.963</td>
<td>0.000***</td>
</tr>
<tr>
<td>H1-2</td>
<td>ME → CER</td>
<td>0.095</td>
<td>0.031</td>
<td>3.098</td>
<td>0.002**</td>
</tr>
<tr>
<td>H1-3</td>
<td>SI → CER</td>
<td>0.842</td>
<td>0.052</td>
<td>16.317</td>
<td>0.000***</td>
</tr>
<tr>
<td>H2-1</td>
<td>CER → PCI</td>
<td>0.919</td>
<td>0.055</td>
<td>16.851</td>
<td>0.000***</td>
</tr>
<tr>
<td>H2-2</td>
<td>CER → CF</td>
<td>0.954</td>
<td>0.060</td>
<td>15.901</td>
<td>0.000***</td>
</tr>
<tr>
<td>H3</td>
<td>CF → PCI</td>
<td>0.246</td>
<td>0.053</td>
<td>4.645</td>
<td>0.000***</td>
</tr>
<tr>
<td>H4</td>
<td>Resilience → PCI</td>
<td>0.798</td>
<td>0.100</td>
<td>7.964</td>
<td>0.000***</td>
</tr>
</tbody>
</table>

\[**p < 0.01, ***p < 0.001\]

5. Discussion

These results propose a discussion based on the results of analyzing the structural relationship between the nostalgia, CER, CF, resilience, and PCI of the DFAP's during the COVID-19 pandemic. First, H1-1, that SA a sub-factor of nostalgia will have a significant effect on CER, was accepted. These results are similar to those in prior study, which indicated Cho [19] found that university students can flexibly control negative emotions such as stress when they experience a sense of belonging and Cho [20] reported that they felt high emotional stability and comfort when participating in DFA with fellow participants. In other words, in a situation where social activities are restricted due to COVID-19, the social experience of participating in DFA with fellow participants controls anxiety and stress and acts as a substrate for inducing positive emotions [44]. In this context, Cheung et al. [55] and Pascal et al. [56] suggest that when people experience and are stimulated by nostalgia, they form positive feelings of warmth, pleasure, and attachment, and have an active attitude toward experiencing and choosing the presence of nostalgia. Therefore, when operating a DFA program, if the participants’ sense of belonging is improved by organizing a program that can improve the emotional intimacy between the leader and the participants, when the social atmosphere is stagnant in the COVID-19 situation, DFAP's recover their emotions through positive recognition of SA nostalgia for DFA, thereby provoking stronger CER to DFA.
Second, H1-2, that ME a sub-factor of nostalgia will have a significant effect on CER, was accepted. This is Wildschut et al. [24] It is the same result as analyzing the contents of experiences that evoke nostalgia and that important episodes in life nostalgia and evoke positive emotions. In other words, it is necessary to induce a strong nostalgia for daily dance by providing various and differentiated physical activity events to the DFAP’s. In addition, if the contents of the physical activity event are recorded as videos or photos and provided to the participants, it will be possible to relieve the desire for physical activity, at least psychologically, in a situation where physical activity is limited, such as COVID-19.

Third, H1-3, that SI a sub-factor of nostalgia will have a significant effect on CER, was accepted. A related study by Bass [25] reported that there was a positive correlation between sensory experience and emotion in physical activity, and Gibbs & Eggermann [57] found the number of people who music related to specific memories or related content has also increased after COVID-19. It is because they depend on the emotions of happiness and stability that are lacking in the present through nostalgia formed by past sensory experiences and it is the basis for theoretically supporting the results of this study. Therefore, it is important to strongly stimulate the SI of participants’ nostalgia by actively utilizing the clean spatial environment, beautiful interior decoration, music, atmosphere, and props that DFA participants perceive sensuously. This will be effective for mental health in relieving anxiety related to COVID-19 just by listening to memorable music or wearing props.

Fourth, H2-1, that CER will have a significant effect on CF, was accepted. These results are similar to those in prior research which indicated Garnefski et al., [29] reported a research result that emotion regulation through cognitive processes gives CF. Also, Bonanno, Rennicke, & Dekel [58] suggested that residents of downtown New York who suffered post-traumatic stress related to September 11 attacks increased resiliency and recovery by more than 35% and 23%, respectively, compared to pre-September 11 attacks, when they chose appropriate coping behavior. As such, appropriate coping behaviors that occur in situations such as COVID-19 are determined by individual cognitive control. In such an unpredictable situation like COVID-19, it is important to independently and actively overcome the emotional anxiety of DFAP’s with their own inner strength.

Fifth, H2-2, that CER will have a significant effect on resilience, was accepted. Genet & Siemer [31] and Waugh et al. [32] supports the results of this study by revealing that when resilience is high, the CER for the situation is also high. Therefore, it was found that CER is very closely related to mental health, including thoughts of stress, depression, and suicide, and acts as an important factor in determining individual well-being and successful functioning by demonstrating flexible resilience according to situational demands.

Sixth, H3, that CF will have a significant effect on PCI, was accepted. In a study by Aikens et al. [59], stress caused by disease-related uncertainty often leads to negative emotional states, and at this time, appropriate coping behavior selection has a significant impact on emotional well-being. In this regard, Galinsky, Howes & Kontos [60] found that since coaches and colleagues form a close relationship with athletes, their emotional, emotional, and informational services support has a positive effect on CF for
unpredictable situations. It was revealed that exercise can be continued, and it was confirmed that the results of this study were quite similar. These results suggest that in a situation like COVID-19, an environment for providing DFA services that can safely meet the needs of the DFAP’s away from the threat from the virus should be established.

Seventh, Rutter [61] and Dyer & McGuinness [62] argued that resilience is a defined characteristic of an individual and at the same time a complex concept of state, and should be understood in the dynamic interaction between innate and external factors. Accordingly, it was reported that resilience had a positive effect on improving athletes' performance and increasing motivation to successfully perform sports [40]. As a result, since the positive emotion on participation in increases resilience through an emotional sharing structure such as transference, the leader increases resilience through praise, support, and encouragement of the participants to encourage continued participation in living dance should be induced. In addition, since the pleasure felt during physical activity is the most important factor in sustaining participation in DFAP's, the importance of operating a program that maximizes the enjoyment of physical activity is emphasized.

6. Limitations Of The Research

First, since this study was limited the population of DFAP’s in Seoul and the Gyeonggi-do region of South Korea, the problem of representativeness of the sample may be raised in the study.

Second, participation in DFA as a physical activity is limited to art dance (Korean dance, ballet, modern) and dance sports, line dance, and K-POP dancing, making it difficult to generalize the results presented in this research to the entire field of DFA. In addition, there is a possibility that there may be differences between variables depending on the characteristics of the field of DFA, but this was not analyzed.

Finally, did not extend to an analysis of the contribution according to demographic characteristic of participants (gender, age, field, experience, and frequency) and the variables set in this study. Therefore, in follow-up research, an in-depth analysis and examination of the influence relationship according to the demographic characteristics of participants should be conducted.

7. Conclusions

The reason why COVID-19 is also called ‘mentaldemic’ is because the number of people who complain of mental pain such as anxiety and depression continues to increase due to social isolation and economic difficulties due to the prolonged COVID-19. Therefore, in this study, nostalgia for DFA was set as an important factor to defend against depression, anxiety, and stress caused by COVID-19, and the process leading to continuous participation was identified as a structural relationship between CER, CF, and resilience the following conclusions were drawn. First, because of testing the hypothesis that nostalgia of DFA will have a significant effect on CER, all sub-factors (SA, ME, SI) have a significant effect on CER. Second, testing shown that the CER of DFAP’s have a significant effect on CF and resilience to COVID-19.
Finally, the CF and resilience of DFAP's was shown to have a significant effect on PCI of DFA. In conclusion, this study shows that in the COVID-19 situation, which is symbolized by social disconnection and isolation, the instinct for physical activity of DFAP's is not easily suppressed, and this instinct for physical activity is expressed as nostalgia of DFA, it has a positive effect on participants' mental health and PCI.

Declarations

Author Contributions:


Institutional Review Board Statement:

Not applicable.

Institutional Review Board Statement:

This research was approved by the Investigator's Center for the Institutional Review Board (approval number: GWNU IRB 2021-34).

Data Availability Statement:

Not applicable.

Conflicts of Interest:

The authors declare no conflict of interest.

References


**Figures**

**Figure 1**

Comparison of depression and anxiety levels before and after COVID-19
Figure 2
Research model.

Figure 3
Path coefficient of the research model.