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Posted Date: 11 December 2023

doi: 10.20944/preprints202312.0646.v1

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Article

The Exploration of Prolonged Mask Use on Appearance Anxiety during the COVID-19 Pandemic in Taiwan

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Abstract: (1) Background: This study aimed to explore how prolonged mask use during the COVID-19 pandemic affected appearance anxiety; (2) Methods: It implemented a quantitative–qualitative mixed-research approach based on a convenience sample of young people in Taiwan; (3) Results: A total of 1,118 participants completed the online questionnaire. A total of 49 participants reached the 55-point threshold of Appearance Anxiety Scale. Higher score of appearance anxiety was correlated to higher state anxiety statistically ($r = 0.4$, $p < 0.001$). Ten participants were interviewed and qualitative content analysis revealed 5 main themes and 16 subthemes. Three of the main themes were related to the positive effects of wearing masks for pandemic prevention and reducing appearance anxiety: “Wearing masks indicates compliance with the epidemic prevention requirement,” “Wearing masks functions as protection against lack of confidence in appearance,” and “Wearing masks helps mitigate the fear of being judged by others.” The remaining two “Wearing masks shifts attention from appearance to figure” and “Prolonged mask wearing exacerbates the anxiety about taking it off” were related to the impacts of long-term mask use; (4) Conclusions: results enhance understanding of negative emotional experiences and anxiety related to physical appearance.

Keywords: COVID-19; mask; physical appearance; anxiety; body image; social interaction

Introduction

As the COVID-19 pandemic spread rampantly, governments implemented rigorous pandemic control and prevention measures. Globally, masks have become indispensable protective gear for outdoor use [1]. Adopting a policy of wearing masks for all in Taiwan is more effective in preventing disease transmission [2]. However, when the pandemic began to decline and governments started loosening the aforementioned measures, many people felt afraid to take off their masks for fear of being plagued by negative emotions such as self-doubt and depression when they see others judge them with looks of suspicion at their appearance.

Extreme concern with one's appearance has been a common issue among the adolescent population. With the ever-rising popularity of social media, people are increasingly worried about how others see them, a trend that has led to the emergence of negative feelings about one's body image [3] and depression and anxiety [4]. Hence, scholars coined the term “appearance anxiety,” also known as “body dysmorphic disorder”, a mental disorder that cripples one's quality of life because of excessive concern with their own appearance [5]. The prevalence rate of appearance anxiety among college students varies from 1.20 to 13.00% [6]. Additionally, appearance anxiety frequently coexists with other mental illnesses and consistently leads to major functional impairments [7], with severe cases even resulting in suicide attempts. Therefore, the impacts of this disorder must not be underestimated.

The questionnaire-based study sought to examine the current status of appearance anxiety among the younger generation in Taiwan, understand the feelings and experiences of young adults with a high degree of appearance anxiety, and explore how prolonged mask use affected appearance anxiety during the COVID-19 pandemic through in-depth interviews with high-risk individuals.

Appearance anxiety can be defined as an individual's preoccupation with slight or imagined flaws in their physical appearance such that it disrupts their daily behaviors and life. It is a type of body dysmorphic disorder (BDD), which, according to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders published by the American Psychiatric Association, refers to "a markedly excessive concern where there is a slight physical anomaly, with associated significant distress and/or functional impairment" [7].

BDD prevalence is 1%–2% among the general population [8], which increases to 2.2% among teenagers, 3.3% among students [9], 5.9% among adult psychiatric outpatients, and 7.4% among their inpatient counterparts [10]. Among people who seek aesthetic procedures, BDD prevalence can be as high as 20.1% for those undergoing rhinoplasty, 13.2% for those undergoing cosmetic surgery, and 11.3% for those undergoing dermatological treatment [11]. Skin conditions (64.2%) and hair issues (42.3%) are two of the most worrying defects among BDD patients [12].

Individuals experiencing BDD symptoms tend to direct their attention to one or more perceived flaws or defects in their appearance [13], which are often too inconspicuous to others [14] but serious enough to cause embarrassment, shame, or anxiety to them. At some point in the course of the illness, such an individual would engage in repetitive behaviors, such as excessive mirror-checking and grooming, and/or pervasive mental acts, such as comparing their appearance to that of others as ways to cope with the pain caused by their preoccupation with the perceived defect. These repetitive behaviors are typically disagreeable and challenging to manage [9]. Excessive worry about being rejected by others is almost always tied to impairments in one's social relationships and daily function [15]. Moreover, studies have found that appearance anxiety is comorbid with other psychiatric conditions, notably major depressive disorder, social phobia, substance abuse, and compulsive-obsessive disorder [7], and the higher the number of comorbidities, the greater the negative impacts on one's health and overall quality of life [10].

Physical appearance is a crucial component of the first impression that an individual leaves on others, affecting both their interpersonal relationships and daily life [16]. With the ubiquity of social media, taking selfies and photos at any given moment has become a common way to portray initial impressions in social interactions. As a result, individuals dissatisfied with their appearance are more likely to experience more intense negative feelings [17,18]. Motivated by the need to achieve an ideal appearance, they work hard to erase their perceived flaws through makeup, diet, and plastic surgery, which then usually cause health issues such as skin and eating disorders [19,20].

Among adolescents, females are more likely than males to suffer from body image issues [21], which have been found to be significantly correlated with depression, anxiety, and other negative emotions [22]. Individuals troubled by body image issues as they evaluate their self-worth through social comparison are more likely to experience self-stigma, which affects their mental health [23]. Excessive concern about appearance creates pressure that compromises their quality of life [24], and the negative feeling from the constant judgment of others leads to a sense of insecurity [25]. An accumulation of such insecurity may escalate one's level of anxiety [26], further worsening into a fear of intimacy, avoidance of social interaction, truancy or absenteeism, and even self-harm and suicidal thoughts [10]. Therefore, it is clear that despite its non-life-threatening nature, appearance anxiety remains detrimental to a person's self-identity, self-worth, and quality of life.

On January 07, 2020, the World Health Organization (WHO) announced the discovery of a new type of coronavirus (later named COVID-19) transmitted mainly through droplets and contact. These droplets often spread through the respiratory tract through daily face-to-face conversations, breathing, coughing, and sneezing [27]. In 2022, the WHO urged individuals to wear masks as a basic preventive nonpharmaceutical intervention against the spread of respiratory infectious diseases. With the continued rise in pandemic prevention awareness among Taiwanese citizens, the percentage of mask wearers increased from 49% to 75% from the early stage of the COVID-19 outbreak to the

first case of death [28]. In the United States, the Institute of Health Metrics and Evaluation reported a 5% increase in the percentage of people wearing masks after the active promotion of the mask mandate by local health authorities and media [29].

As the COVID-19 pandemic peaked, affected countries began formulating and implementing rigorous prevention measures. When the National Health Command Center of Taiwan's Center for Disease Control raised the nationwide epidemic alert to Level 2, wearing masks while outdoors became mandatory and a punishable violation [30]. Meanwhile, the U.S. Center for Disease Control and Prevention (CDC) strongly recommended that, regardless of vaccination status, citizens wear masks in public indoor environments and areas marked with a high-risk of community transmission [31]. Other countries also required their citizens to wear masks when experiencing discomfort or symptoms and when in crowded and inadequately ventilated indoor spaces, outdoor locations, hospitals, and public transportation [1]. An array of studies has confirmed the correlation between wearing masks and preventing the inhalation of pathogens as the former can lower the risk of infection during unavoidable face-to-face contact [32]. Therefore, at the height of the pandemic, mask wearing became a fixed aspect of outdoor scenery everywhere as a key measure against being infected with or spreading COVID-19.

Wearing masks may reduce an individual's need to display facial expressions [33]. While it is probable that wearing masks may impact one's autonomy, mask wearing helps increase their sense of inclusion or identity as mask use becomes commonplace or even necessary among their peers [34]. People with preexisting social anxiety disorders consider masks not only as protection against viruses but also as a safety blanket to relieve social pressure due to concerns about exposing facial flaws [1]. According to psychologists, wearing masks can lower one's desire to communicate with others because of their inability to judge that person's feeling by detecting smiles or anger, thereby providing the individual with a certain personal space [35].

Wearing masks can cause facial discomfort, leading to mental disorders and other side effects [36]. It also impedes interpersonal communication by affecting facial recognition [37] and impairing one's ability to distinguish emotions [33] due to the fact that masks typically conceal the lower portion of the facial region. In addition, mask wearing creates a sense of distance and increases the anxiety and pressure of social interaction [23] as it aggravates social anxiety [38] and diminishes communication content and one's willingness to engage in conversations and develop interpersonal relationships [39].

2. Materials and Methods

2.1. Research Design

Adopting a mix of quantitative and qualitative methods [40], this study first used an online questionnaire that incorporated quantitative measurement scales to understand participants' levels of appearance anxiety and state anxiety. After providing their consent, those who scored high in appearance anxiety underwent a semi-structured in-depth interview developed based on a qualitative descriptive research design to facilitate a general understanding and description of their specific experiences, understand their responses to pandemic-related issues, and examine the implications of appearance anxiety to them. This study aimed to explore the feeling, attitude, and experience of prolonged mask use affected appearance anxiety during the COVID-19 pandemic.

2.2. Research Subjects

2.2.1. Quantitative Study

Through convenient sampling, research subjects were selected among students and staff members at two universities in central Taiwan to complete an online questionnaire. Enrollment criteria were (1) between 15 and 35 years old, (2) a young person of either gender, and (3) agreement to participate.

2.2.2. Qualitative Study

Purposive sampling was also performed to recruit research subjects for the qualitative study. In-depth interviews were conducted with online questionnaire participants who expressed consent and met the following inclusion criteria: (1) Appearance Anxiety Scale (AAS) score in the top 5 percentile, (2) actively conscious and able to communicate in both Mandarin and Taiwanese, and (3) agreement to participate. Meanwhile, exclusion criteria included (1) cognitive impairment and (2) a diagnosis of severe mental disorders including schizophrenia and bipolar disorder.

2.3. Data collection

Data were collected in two stages.

2.3.1. Quantitative Study

Quantitative data were gathered from the completed questionnaires, focusing on participants' personal data and the results of the AAS and the Chinese Mandarin State-Trait Anxiety Inventory Form Y (CMSTAI-Y).

1. Personal Data

Participants' personal data included six items on personal information (age, height, weight, gender, marital status, and education level) and four pandemic-related items (issues of concern, sleep quality, activity/exercise status during the past month, and changes in interpersonal relationships during the past month).

2. Appearance Anxiety Scale

The AAS, developed by Dion and colleagues in 1990 [41], contains 15 questions rated on a five-point Likert scale from "never" (one point) to "always" (five points), with higher scores indicating a greater degree of appearance anxiety. The reliability and validity of the AAS were tested; the Cronbach's alpha value for internal consistency was 0.86, and the two-week test-retest reliability value was 0.89 [42].

3. Chinese Mandarin State-Trait Anxiety Inventory Form Y

The CMSTAI-Y is a self-reported scale developed by Spielberger in 1983 and incorporates one subscale with 20 questions on state anxiety and another subscale with 20 items on trait anxiety. Scores ≥ 60 indicate a high level of anxiety. Translated into Chinese by Ma and colleagues, the CMSTAI-Y was tested on 306 subjects and indicated good reliability and acceptable internal consistency and stability (Cronbach's alpha: 0.91 for state anxiety and 0.92 for trait anxiety; two-week test-retest reliability: 0.76 and 0.91, respectively) [43]. Moreover, the inventory is highly correlated with the Hamilton Anxiety Rating Scale with 0.69 for state anxiety and 0.74 for trait anxiety, indicating acceptable construct validity [43]. For this study, the threshold for high state anxiety was set at 60 points based on the literature [44,45].

2.3.2. Qualitative Data

During the semi-structured interviews with participants suffering from severe appearance anxiety, qualitative data were collected using recording and handwritten notes to understand their feelings and experiences. The interviews, which lasted approximately 30–50 minutes each, were conducted at venues conducive to the participants' comfort and safety.

The interviews began with an explanation of the purpose of the interview and a self-introduction and proceeded to focus on the following questions:

1. What is your opinion of your own appearance?
2. Do you mind talking about the factors that affect your emphasis on appearance?
3. How do you feel about the features of your appearance that you are dissatisfied with?

How do you try to improve them?

4. How do you feel about wearing a mask?
5. How does wearing a mask affect your life?

6. What are your thoughts on the need to wear masks outdoors during the pandemic?
7. Has the pandemic changed your opinion of your appearance? Would you like to talk about those changes?
8. Have you discussed your issues with your appearance with your family/friends? How did they react?
9. What kind of assistance would you like your family or friends to provide?
10. Overall, what kind of assistance do you feel you need the most?
11. Thank you for accepting the interview. Is there anything else you would like to add?

2.4. Data Analysis

2.4.1. Quantitative Data Analysis

Statistical Package for the Social Sciences version 21.0 was used for data analysis and processing. For descriptive statistics, frequency and percentage represented the categorical variables, while the mean, standard deviation, maximum value, and minimum value presented the distribution of continuous variables. For inferential statistics, a chi-square test was performed to analyze the differences in data between participants with different background variables such as gender, and an independent-sample t-test was conducted for analysis. In addition, Pearson correlation coefficients (r) were used to examine the relation between the two anxiety scales.

2.4.2. Quantitative Data Collection

Quantitative data were analyzed using Tesch's (1990) content analysis approach, which includes open coding, categorization, naming, and development of themes and subthemes. The analysis is summarized by the following steps:

1. Carefully listening to the contents of the recorded interviews and transcribing the original statements to help construct the overall data background,
2. Reading and reflecting on the interview contents to identify implied meanings for subsequent clarification and/or further exploration,
3. Consulting an expert to compare categorizations and classify similar meanings into the same category after completing the first transcript analysis,
4. Converting the previously classified meanings into codes and placing them in the appropriate original transcribed data to examine the relevance of the codes and data content and identify new meanings,
5. Listing all codes and categories for final review, and
6. Forming themes and subthemes.

2.5. Research Rigor

The study's rigor was assessed based on credibility, transferability, dependability, and conformability principles [46]. To ensure credibility, the study shortened the duration of the interviews and increased their frequency on an as-needed basis to help participants stay composed and improve contact and foster trust with them. The participants verified the transcribed and edited content of each interview to ensure accuracy. Moreover, peer debriefing was conducted and reflexive journals kept and reviewed to safeguard the credibility of data analysis and establish research vigor [47–49].

2.6. Ethical Concerns

After obtaining approval from the institutional review board (CMUH111-REC3-147), this study was conducted in compliance with the principles of autonomy, confidentiality, and no harm to participants. Upon securing approval, the study recruited participants who met the enrollment criteria and explained to them the purpose and process of the study to obtain their preliminary consent. The time and place for the interviews were then arranged with each participant; before the

interviews, the study’s purpose and process were explained again, including the potential positive and negative effects that may arise during the interview. The participants were assured that they were free to withdraw from the interview and the study anytime without any effect on their rights.

3. Results

3.1. Research Design

The study used a mix of quantitative and qualitative approaches to understand what young people in Taiwan think of appearance anxiety and mask wearing policies and appearance anxiety. The following sections present the results, which include those of the questionnaire survey and the qualitative interviews.

3.2. Questionnaire Survey

3.2.1. Analysis of Quantitative Data

From June 29 to December 14, 2022, a total of 1,118 participants completed the online questionnaire, including 749 females (67%), 368 males (32.9%), and 1 “other” (0.1%). Their average age and body mass index were 23.6 years (*SD* = 9.3) and 21.6 kg/m² (*SD* = 3.8), respectively.

Of the participants, 50.9% (*n* = 569) were not particularly concerned about the pandemic, while 39.1% (*n* = 437) expressed worry. For the latter group, “health threat to family members” emerged as the top concern, which was reported by 341 participants (30.5%), followed by “physical discomfort due to confirmed infection” (249; 22.3%), “epidemic showing no sign of abating” (239; 21.4%), and “continuation of the mask mandate” (67; 6%). Table 1 shows the complete list of concerns.

When the participants were asked to rate their sleep quality, 72.5% (*n* = 811) reported experiencing no sleep problems. For those with compromised sleep quality, the top concern was “still feel tired during the day in spite of adequate sleep,” reported by 136 participants (12.2%). Regarding the participants’ activity status during the past month, their top preference was “1-2 times of sweat workout per week,” reported by 320 participants (28.6%). For interpersonal relationships, majority of the participants (963; 86.1%) experienced no significant changes in the last month. Table 2 provides further details.

Higher AAS scores indicate a greater degree of appearance anxiety. A total of 49 participants (in the top 5 percentile and 4.4% of the total number of participants) reached the 55-point threshold. Meanwhile, a CMSTAI-Y score of ≥60 indicates a high level of general anxiety. A total of 60 participants (5.4%) reached the threshold for high state anxiety. Tables 3 and 4 show the detailed distribution data. The results of these two anxiety scales showed a clear correlation (*r* = 0.4, *p* < 0.001). For appearance anxiety, there was a higher percentage of female participants (*n* = 39, 5.2%) than male participants (*n* = 10, 2.7%); this difference, however, failed to reach statistical significance (χ^2 = 3.643, *p* = 0.056).

Table 1. Issues of concern during the COVID-19 pandemic.

<i>What is your major concern about the epidemic?</i> <i>(Feel free to mark more than one)</i>	
No particular concern	569 (50.9%)
Physical discomfort due to confirmed infection	249 (22.3%)
Identified as a contact for home isolation	176 (15.7%)
Social stigma associated with being a confirmed case	27 (2.4%)
Continuation of the mask mandate	67 (6.0%)
Emergence of new variants	166 (14.8%)
Epidemic showing no sign of abating	239 (21.4%)
Inflationary pressure	155 (13.9%)
Health threat to family members	341 (30.5%)

Epidemic prevention and control measures too confusing	141 (12.6%)
Threat to job security	28 (2.5%)
Other(s)	9 (0.8%)

Table 2. Survey results for sleep quality, exercise status, and interpersonal relationships during the past month.

<i>What best describes your sleep quality during the past month?</i> (Feel free to indicate more than one)	
No sleep problem	811 (72.5%)
Difficult to fall into sleep (more than 30 minutes needed)	129 (11.5%)
Sleep disrupted (wake up 2 or more times at night)	89 (8.0%)
Wake up before scheduled time and unable to go back to sleep	44 (3.9%)
Still feel tired during the day in spite of adequate sleep	136 (12.2%)
Medication needed to help sleep	23 (2.1%)
<i>What best describes your activity/exercise status during the past month?</i> (Feel free to indicate more than one)	
Do not have the habit of exercise	309 (27.6%)
3–5 times of sweat workouts per week	196 (17.5%)
1–2 times of sweat workouts per week	320 (28.6%)
Occasional outdoor walk, about 30 minutes per walk	251 (22.5%)
Amount of outdoor activity decrease considerably as compared to pre-epidemic period	155 (13.9%)
Becoming too lazy to engage in outdoor activity	341 (30.5%)
<i>Did your interpersonal relationships undergo any change during the past month?</i>	
No significant change	963 (86.1%)
Change for the better	116 (10.4%)
Change for the worse	39 (3.5%)

Table 3. Appearance anxiety level concerning mask use in the past month.

<i>Result/Distribution of AAS Score</i>	
Average Score	29.1 (12.2)
<i>Cutoff Point Set at Mean Value</i>	
Low Appearance Anxiety (≤ 25 points) N (%)	581 (52.0%)
High Appearance Anxiety (> 25 points) N (%)	537 (48.0%)
<i>Cutoff Point Set at 75th Percentile</i>	
Low Appearance Anxiety (≤ 35 points) N (%)	855 (76.5%)
High Appearance Anxiety (> 35 points) N (%)	263 (23.5%)
<i>Cutoff Point Set at 95th Percentile</i>	
Low Appearance Anxiety (≤ 55 points) N (%)	1,069 (95.6%)
High Appearance Anxiety (> 55 points) N (%)	49 (4.4%)

* Note: Score range of 16–80 points, with higher scores indicating a greater degree of appearance anxiety.

Table 4. General (state) anxiety level concerning mask use in the past month.

<i>Result/Distribution of CMSTAI-Y State Score</i>	
Average Score	44.1 (10.5)
Low General Anxiety (20–39) N (%)	257 (23.0%)
Moderate General Anxiety (40–59) N (%)	801 (71.6%)
High General Anxiety (60–80) N (%)	60 (5.4%)

*Note: Score range of 20–80 points, with higher scores indicating a greater degree of general anxiety.

3.3. Interviews

The AAS assessment results showed that 49 participants reached the cutoff of 55 points, which means they experienced a high level of appearance anxiety. However, among these participants, only 10 (1 male and 9 females) consented to the interviews. The ages of these 10 interviewees were 20 (n = 1, 10%), 21 (n = 4, 40%), 22 (n = 4, 40%), and 30 years (n = 1, 10%). From the interview data, 5 main themes and 16 subthemes emerged. Of the five main themes, three were associated with the positive effects of prolonged mask use on pandemic prevention and the alleviation of negative feelings linked to appearance anxiety: “Wearing masks indicates compliance with the epidemic prevention requirement,” “Wearing masks functions as protection against lack of confidence in appearance,” and “Wearing masks helps mitigate the fear of b being judged by others.” The remaining two “Wearing masks shifts attention from appearance to figure” and “Prolonged mask wearing exacerbates the anxiety about taking it off” were related to the impacts of long-term mask use. Table 5 shows the main themes and subthemes.

Table 5. Main themes and subthemes based on analysis of interview results.

Main Theme	Subtheme
1. Wearing masks indicates compliance with epidemic prevention requirement.	1-1. Wearing masks affect daily life
	1-2. Epidemic does not change the way I feel about my look
	1-3. Wearing masks helps prevent infection and keeps me warm
	1-4. I keep wearing masks during the epidemic
2. Wearing masks functions as protection against lack of confidence in appearance.	2-1. I was already wearing masks before the epidemic outbreak
	2-2. I lack confidence in my appearance
	2-3. I need to find ways to cope with my poor appearance
3. Wearing masks helps mitigate the fear of being judged by others.	3-1. Wearing masks saves time looking after my appearance
	3-2. There is no need to worry about others’ judgment
	3-3. Wearing masks reduces my need to manage facial expressions
	3-4. Wearing masks enhances my sense of security
4. Wearing masks shifts my attention from appearance to figure.	4-1. I often worry about my appearance
	4-2. I often pay great attention to how I look
	4-3. I shift my attention to my figure after wearing masks
5. Prolonged mask wearing exacerbates the anxiety about taking it off.	5-1. I keep wearing masks after the mandate is lifted
	5-2. Wearing masks exacerbates my appearance anxiety

Theme 1: Wearing Masks Indicates Compliance with Pandemic Prevention Requirements

For a few interviewees (hereafter called “cases”), the mask wearing requirement for pandemic prevention was a disruption to their daily life that forced them to change some habits and routines. Most cases, meanwhile, found that wearing masks have no significant impact on their life; some were even willing to continue wearing them as it provided dual benefits of preventing infection and maintaining warmth. Under these main themes were four subthemes: “Wearing masks affect daily life,” “Epidemic does not change the way I feel about my look,” “Wearing masks helps prevent infection and keeps me warm,” and “I keep wearing masks during the epidemic.”

Subtheme 1-1: Wearing Masks Affects Daily Life

Several cases did not wear masks before the outbreak of the pandemic because it affected their breathing. Therefore, they considered the mask mandate an inconvenience in their daily life:

Of course I had rejection against it at first. Just didn’t like to wear masks. After all, it prevents me from breathing as smoothly as I would like to. My daily activities are affected. (Case D)

It’s an extra source of pressure in life. Everywhere you go, you just couldn’t help worrying about if you are wearing it or not. (Case G)

Subtheme 1-2: The Epidemic Does Not Change the Way I Feel about My Look

A few cases reported that the pandemic did little to change how they felt about their appearance, which to them was something inborn or inherent and therefore difficult to change. They stated that instead of making efforts to alter their appearance, it would be wiser for them to cope with it in a way that is comfortable to them:

I think that I have found a way to live with my look. Wearing no makeup. That makes me more relaxed. If I feel more relaxed, then I don't wear makeup. (Case G)

Does the epidemic change the way I feel about my look? Hmm... don't think it does. Zero change in the way I feel about my appearance. (Case I)

Subtheme 1-3: Wearing Masks Helps Prevent Infection and Keeps Me Warm

Most cases stated that wearing masks outdoors protected them from blasts of cold air and reduced nasal allergy symptoms:

Winter is cold, freezing, and wearing masks keeps you warm. So, I'm okay with it in winter, but not in summer. (Case E)

You don't sneeze, cough, or have runny nose that easily. It's like, you know, improve your allergic constitution. (Case F)

Subtheme 1-4: I Keep Wearing Masks During the Epidemic

According to the cases, mask wearing has become a habit because of long-term use, and their reliance on masks increased as they discovered its many benefits:

I've been wearing masks since 2019, and from then till now, I've met lots of new people and new friends. Nearly never take off my mask when I'm with them. So, I come to fear that I may not be able to meet their expectations of me if I suddenly take off my mask, standing in front of them kind of naked. (Case A)

I feel that I've grown to rely on the mask to such a degree that I don't want to take it off... mean when I'm out there. (Case I)

Theme 2: Wearing Masks Functions as Protection against Lack of Confidence in Appearance

Most cases who were dissatisfied with their appearance depended on masks to increase their sense of security. Some interviewees were in fact already wearing masks or felt the need to do so even before the pandemic because of their lack of confidence in their appearance. Hence, they considered the mask mandate welcome news. Under this theme are the following three subthemes.

Subtheme 2-1: I Was Already Wearing Masks Before the Epidemic Outbreak

Before the pandemic outbreak, several cases already had the habit of wearing masks when outdoors, only taking them off when asked to. The government's announcement and implementation of the mask mandate enabled them to wear masks with a greater sense of righteousness and peace of mind:

I have no problem taking my mask off if I am required to. Otherwise, I just keep wearing it. (Case B)

I thought about wearing masks when there was no mandate before the outbreak of the epidemic. (Case J)

Subtheme 2-2: I Lack Confidence in My Appearance

Most cases envied good-looking people and were accordingly bothered by the defects in their appearance. These perceived flaws led to a sense of inferiority and subsequently sparked a range of negative emotions.

I have this jaw with an obvious protrusion. On both sides here. Not a beautiful oval face at all. (Case C)

I just couldn't help feeling envious when I see someone better-looking than me. (Case H)

Subtheme 2-3: I Need to Find Ways to Cope with My Poor Appearance

Most cases felt that they needed to exercise, practice their religious faith, or engage in other tasks to adjust their mood and cope with their negative feelings about appearance anxiety. Such efforts, despite not always achieving the desired effectiveness, indicated their refusal to keep immersing themselves in negative emotions:

I rely mainly on workout, and sometimes on religion. Like going to church to seek inspirations capable of making myself more confident and less worried about my appearance. (Case D)

When I am bogged down in the quagmire of appearance anxiety, I have the feeling that I should not allow myself to stay there. I need to shift my attention, doing something else to get rid of the fixation. Sometimes it works, sometimes it doesn't, and when it doesn't, I continue to get mired in depression. (Case F)

Theme 3: Wearing Masks Helps Mitigate the Fear of Being Judged by Others

With the mask covering a significant area of one's face, most cases found that wearing masks minimized the need to manage facial expressions and worry about others' looks of suspicion. It also brought them a sense of security and helped them improve their overall efficiency in daily activities. This theme includes the four subthemes.

Subtheme 3-1: Wearing Masks Saves Time Looking After My Appearance

For most of the cases, because the masks covered the perceived defects on their faces, they reduced the time needed to maintain their appearance. To a few of them, wearing masks provided them with the opportunity to address the parts of their faces they were dissatisfied with:

It's nice wearing masks. I look better as the mask covers those parts I don't like about my appearance. (Case C)

It helps when you have to wear braces. They get covered by the mask, so I feel less awkward wearing them. (Case H)

Subtheme 3-2: There Is No Need to Worry about Others' Judgment

Most cases, when not wearing masks, had to dedicate a significant amount of time to maintaining their appearance due to concerns about how they would be perceived by others. Long-term mask use was therefore a protection against those looks of judgment:

With the mask, they can't tell exactly how you look, so wearing masks saves me from worrying about others' judgment. (Case E)

I care much less about if anyone is staring at me now that I have to wear mask out there. (Case I)

Subtheme 3-3: Wearing Masks Reduces My Need to Manage Facial Expressions

When engaged in communication while wearing masks, most cases did not need to pay close attention to using appropriate facial expressions. Thus, mask wearing was beneficial to reduce anxiety especially for those whose facial expressions often caused them to feel embarrassed in social interactions. Wearing masks was also found to improve one's efficiency in daily activities:

Mask makes it easier for me to engage in social interaction. I feel more comfortable when I don't have to squeeze out a smile or something. No need for enthusiastic responses. (Case C)

I find myself doing things with greater efficiency with the mask. (Case J)

Subtheme 3-4: Wearing Masks Enhances My Sense of Security

Cases were more likely to feel less confident, more insecure, and even ashamed of themselves when they do not wear masks. As mask wearing became mandatory for the public when going outdoors, they felt an increased sense of security and thus became less nervous and worried:

Going out without a mask seems like riding a motorcycle without a helmet to me. (Case A)

I have never been very confident in my own look. So wearing masks makes me feel more comfortable with myself. Without the mask, I feel sort of ashamed of myself as if I'm not wearing an essential piece of clothes. (Case D)

Theme 4: Wearing Masks Shifts My Attention from Appearance to Figure

Majority of the cases were worried about whether their appearance met most people's expectations and therefore felt a need to improve their looks by removing or covering their perceived flaws. With the implementation of the mask mandate, they shifted their attention from their appearance to their figure. Moreover, a few cases reported that mask wearing did have its disadvantages despite its protective function against others' judgment. This main theme incorporates three subthemes.

Subtheme 4-1: I Often Worry about My Appearance

Most of the cases were obsessed with people's judgment of their appearance and were desperate to meet the public's beauty standards, thus constantly feeling anxious about their inability to do so:

When someone points out a flaw of mine, I'd be obsessed with that flaw, thinking all the time about how to fix it. (Case A)

When I am hanging out with a small group of friends, I would worry about my image. Is this okay or is that a problem? I keep feeling anxious to the degree that I can't enjoy the gathering. (Case J)

Subtheme 4-2: I Often Pay Great Attention to How I Look

Most cases exerted much effort in correcting their perceived defects or flaws hoping to achieve an "ideal" appearance. Some even entertained the idea of undergoing plastic surgery:

A rosebud mouth, cherry lip, straight Greek nose, and oval face. That's the standard of beauty I'd like to achieve, so I feel really sorry for myself when I can't. (Case B)

Wishing to improve my appearance, I often have the urge to have cosmetic surgery when I see those ads. (Case E)

Subtheme 4-3: I Shift My Attention to My Figure after Wearing Masks

According to the cases, as mask wearing minimized differences in people's appearance, others began focusing more on their body or figure:

When I wear masks, I tend to care more about if others would find me too fat, too thin, and things like that. (Case B)

Now that everyone is wearing masks, I get the feeling that we are all shifting our attention to others' figure or dress. (Case H)

Theme 5: Prolonged Mask Wearing Exacerbates the Anxiety about Taking It Off

Most cases committed to wearing masks even with the lifting of the mandate. Given the considerable period that has transpired since they last engaged in maskless interactions with others, they felt an enhanced sense of insecurity about their appearance and ended up more nervous and anxious. This theme includes two subthemes.

Subtheme 5-1: I Keep Wearing Masks after the Mandate Is Lifted

With their lack of confidence in their appearance and fear that people may start judging their looks without the mask, most cases planned to continue wearing masks even after the mandate was no longer in effect:

I'll keep wearing masks; that makes my flaws less discernible and may even create a sense of misty beauty. (Case F)

It seems that the mandate will be lifted soon, and I start to feel anxious again about people's talking behind my back if I choose to keep wearing masks. (Case J)

Subtheme 5-2: Wearing Masks Exacerbates My Appearance Anxiety

With the impending lifting of the mask mandate, cases would have to face others in their everyday appearance. This caused them to start re-experiencing the nervousness and anxiety they felt when there was still no mask wearing requirement:

With the mask taken off, I need to keep paying attention to my facial expression. Will people think that I'm putting up a long face when I am simply not smiling? I have the feeling that I'm somewhat responsible for causing a misunderstanding like that because I am not good-looking enough to others. (Case A)

I do feel worried now that the mask mandate will soon be lifted. It brings great pressure, I mean having to face people with your "true" appearance. Lots of pressure. (Case E)

Discussion

Masks have been an effective preventive measure against COVID-19 infection. As mask wearing became compulsory outdoors, most of the interviewees who were identified as cases with high appearance anxiety found that the mandate reduced their fear of frequently being looked at and judged by other people, hence, building a sense of security. However, as the pandemic began to subside with the prospect of people no longer being required to wear masks, interviewees felt increasingly anxious regarding the requirement to take off their masks to engage with others in their natural, exposed state, "unsheltered" appearance. Addressing the research gap in both domestic and foreign journals, this study is the first formal investigation of how prolonged mask use affects appearance anxiety in Taiwan, where the mask mandate has been rigorously implemented for two years. Despite being a well-intended policy for protecting citizens against COVID-19, the mask mandate has become a detriment to the mental well-being of individuals with severe appearance anxiety during the postpandemic era. In addition to collecting anxiety-related quantitative data, this study also conducted in-depth qualitative interviews with individuals suffering from severe appearance anxiety to explore their feelings and experiences about the mask mandate. The findings here are expected to provide healthcare and counseling professionals with insights into appropriate and effective assistance to help individuals with a high level of appearance anxiety to cope with and adjust to the changes brought about by the lifting of the mask mandate.

This study found a statistically significant correlation between appearance anxiety and state anxiety; that is, subjects with a higher degree of appearance anxiety also experienced greater state anxiety, a finding consistent with those of other studies [50,51]. Also noteworthy is that sleep disorder was a common problem in some interviewees, which also echoes studies that have found that poor sleep quality and insomnia [52], reduced outdoor activities [53], and lack of energy due to frequent fatigue [54] were correlated to the COVID-19 pandemic. However, although some studies observed a clear decline in social interactions during the pandemic [55], the majority of participants in the study did not experience any significant changes in their interpersonal relationships. This difference may be attributable to the higher average age of this study's participants at 23.6 years compared with that of other studies at 20.7 years; the younger the individual, the higher the susceptibility of their social interactions to the pandemic.

This study also observed the statistically significant influence of gender on one's level of appearance anxiety as a higher proportion of female participants suffered from a high degree of appearance anxiety. This finding is consistent with that of Jin and colleagues [56]. The female participants in this study not only reported a generally higher degree of appearance anxiety but were also more willing to engage in the in-depth interviews. The interviewees in this study displayed a lack of confidence regarding their appearance. As a result, they devoted significant effort to observing how others perceived them and made substantial attempts to enhance their appearance and regulate their emotions in order to alleviate the negative feelings caused by their anxiety about how they looked. Studies reached similar conclusions in that, compared with males, females are less satisfied with their appearance, pay more attention to their body image, and care more about what others think about their appearance [57,58]. Echoing Guo and colleagues' (2022) finding, this study observed that the pandemic-induced mask mandate accidentally functioned as a protection and security mechanism for participants who were anxious about their appearance. Moreover, as indicated in some recent studies, citizens' reduced frequency of daily outdoor activities during the epidemic prevented them from maintaining or achieving their ideal weight; these failed attempts at remaining fit in turn aggravated their negative feelings about themselves [59,60]. With their faces covered by the mask, individuals with a higher degree of appearance anxiety are likely to switch their attention to their body as suggested by main theme 4 ("Wearing masks shifts my attention from appearance to figure"). Further, this study found a statistically significant positive correlation between state anxiety and appearance anxiety, suggesting the absence of a decline in the interviewees' overall anxiety.

The pandemic, since its onset, has instilled individuals with a pervasive apprehension of contracting the virus. Nearly 40% of the survey respondents expressed worry over the pandemic, with threats to the health of family members being the top concern. Only 6% of these participants were concerned about the continuation of the mask mandate. In this study, the interviewees with severe appearance anxiety agreed that wearing masks was beneficial to their social interactions; meanwhile, it was the prospect of the end of the mask mandate that caused them to feel anxiety. This result is seldom mentioned in other studies. Notably, this study was conducted in an Asian culture, where mask wearing is a frequently adopted preventive measure against pollution and allergens [61]. The study's interviewees experience significant anxiety when they remove masks, rather than simply wearing them. This finding is not different from the one reported by another study on body dysmorphic disorder [62], which indicated that the COVID-19 pandemic intensified one's preoccupation with their appearance and body and subsequently led to discomfort, low self-esteem, and other negative emotions [63]. The study thus suggested that healthcare and counseling professionals offer individuals with a high degree of appearance anxiety (such as those in the top 5% of the AAS assessment) early assistance by conducting cognitive behavioral therapy to help them learn to appreciate their own advantages and strengths [10]. Establishing support networks to help high-risk individuals build self-confidence is also a frequently adopted intervention [64].

The study has three major limitations. First, its sample may not be as representative as expected because the online survey targeted students at two universities in central Taiwan. These participants were relatively older and may include a substantial number of graduate students and university staff members, thus making it difficult to infer the situations and concerns of typical undergraduate

students. With regard to the interview sample, males were an obvious minority, which limits the study's ability to comprehensively assess the influence of gender on appearance anxiety. Moreover, the survey was posted online for six months and was completed only once by each participant because of the study's cross-sectional design. This makes it impossible to offer causal inferences about whether an observed impact was due to the confirmed infections or simply concerns about the pandemic. Hence, future studies should consider interviewing more male participants to facilitate a better understanding of the impacts of prolonged mask use during the pandemic on individuals with severe appearance anxiety as well as their mental health needs.

Conclusion

Under the impact of prolonged mask use during the COVID-19 pandemic, 4.4% and 5.4% of the study's participants reported suffering from severe appearance anxiety and state anxiety, respectively. The interviewees initially felt a sense of security from wearing masks in compliance with the mandate. However, as they faced the prospect of the mask mandate being lifted, they began feeling increased pressure as they could no longer continue wearing masks as a coping mechanism for their appearance anxiety. By offering insights into the interviewees' negative emotions and self-perceptions, this study is expected to help healthcare professionals and school counselors to better empathize with individuals suffering from appearance anxiety and to develop more appropriate and effective strategies for coping with the stress associated with removing their masks and thus facilitate their successful integration back into public life.

Author Contributions: Conceptualization, L.-J.S and W.-F.M.; methodology, L.-J.S and W.-F.M.; validation, L.-J.S and W.-F.M.; formal analysis, L.-J.S and W.-F.M.; investigation, L.-J.S and W.-F.M.; resources, L.-J.S and W.-F.M.; data curation, L.-J.S and W.-F.M.; writing—original draft preparation L.-J.S, T.H.C and W.-F.M.; writing—review and editing, and L.-J.S, T.H.C and W.-F.M.; supervision, W.-F.M.; project administration, W.-F.M.; funding acquisition, W.-F.M.; All authors have read and agreed to the published version of the manuscript.

Funding: This study was supported by the Ministry of Science and Technology (NSTC112-2314-B-039-015; MOST110-2314-B-039-041-MY2) and China Medical University (CMU111-S-24; CMU110-MF-116), Taiwan.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the approval from the institutional review board (CMUH111-REC3-147).

Informed Consent Statement: Written informed consent has been obtained from the participants to publish this paper.

Data Availability Statement: These study data are identified participant data. The data that support the findings of this study are available beginning 12 months and ending 36 months following the article publication from the corresponding author, Wei-Fen Ma, upon reasonable request at lhdaisy@mail.cmu.edu.tw.

Acknowledgments: The authors acknowledge all the participants for their contribution in the study, and Ministry of Science and Technology (NSTC112-2314-B-039-015; MOST110-2314-B-039-041-MY2); China Medical University (CMU111-S-24; CMU110-MF-116), Taiwan for research funding.

Conflicts of Interest: Three authors declare no conflict of interest.

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