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# HWA-BYUNG (화병): THE ASSOCIATIONS BETWEEN THE BIG FIVE PERSONALITY TRAITS AND PSYCHOPATHOLOGY IN KOREANS AND AMERICANS

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**ABSTRACT**

HWA-BYUNG (화병): THE ASSOCIATIONS BETWEEN

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PSYCHOPATHOLOGY IN KOREANS AND AMERICANS

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Hwa-byung is an emotional and behavioral condition as well as cultural concept of distress primarily observed in Korean populations. The *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) classified hwa-byung as a Korean cultural-bound syndrome in 1994 (Min & Suh, 2010; as cited in APA, 2000). According to the DSM-IV, it often arises among middle-aged or older Korean women, but it can be occur in any gender across the lifespan. This study applied a combined emic-etic methodology to measure hwa-byung and examine the relationship between hwa-byung, Big Five personality traits, and psychological symptoms of distress (e.g., anxiety, depression, and sleep disturbance). The total sample of 328 participants comprised 149 participants from South Korea (ages 20 to 77) and 173 participants from the United States (ages 17 to 35). The hwa-byung assessment yielded a total score as well as scores on psychological, cardiovascular, and somatic symptoms subscales. As expected, the mean hwa-byung total score was significantly higher in Korean participants ($M = 57.4$, $SD = 30.8$) than in American participants ($M = 48.8$, $SD = 29.9$), but other findings were unanticipated. Given the recent emphasis on cultural competence in the mental health professions, it is important that American clinicians working with Koreans or Korean-Americans gain an understanding of hwa-byung.

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**INTRODUCTION**

The population of Asian Americans has risen significantly in the United States

from 2000 to 2019 (Shimkhada & Ponce, 2022). The U.S Census Bureau (2022)

indicated that approximately 25 million individuals identified as Asian. Specifically, this

data showed that roughly 2 million Koreans live in the United States (U.S Census

Bureau, 2022). Given that the Korean population is increasing, there is a need for

culturally competent healthcare providers to treat Asian Americans, particularly Korean

Americans in the United States. This is crucial in clinical practice as clinicians should be

aware of cultural syndromes observed in various cultural groups. Clinicians should be

acquainted with hwa-byung to effectively treat and diagnose individuals especially when

interacting with Korean patients.

**Hwa-Byung and Its Symptoms**

Hwa-byung (화병) is a cultural concept of distress that appears primarily in

Korean populations. It is a traditional psychological condition in Korea (Lee et al., 2023;

Kim et al., 2014), where *hwa* is implied as anger or fire and *byung* is implied as illness or

disease. Therefore, hwa-byung is interpreted as an *anger illness* or *fire disease* (Lee et al.,

2023; as cited in APA, 2000 & Min, 2009). Nevertheless, hwa-byung cannot be precisely

defined, but it is often described as a syndrome with persistent distress. Lee and

colleagues (2023) clarified that hwa-byung can be defined as suppressed anger (as cited

in APA, 2000 & Min, 2009) as well as an inability to cope with chronic emotional

distress. Several previous studies explained that hwa-byung can also be considered a

primary emotion of anger (Lin, 1983; Choi et al., 2021; Suh et al., 2021; Cheon &

Cesario, 2022; Lee et al., 2023). As such, it is essential for healthcare providers in the

United States to comprehend the cultural context of hwa-byung and how impacted individuals express symptoms and distress.

*Hwa* (화) is not technically the basic emotion of anger. The *hwa* is described as fire, expressing the sensation of *inner fire* (i.e., burning from the inner core). Ultimately, this can lead to anger outbursts or crises when individuals restrain *hwa*. Hwa-byung is also known as *wool-hwa-byung* (울화병), where *wool-hwa* (울화) can be expressed as anger arising from an internal source. These indications can be based on specific emotions (i.e., *uk-wool* or *boon*), explained as relative implications[1] but distinct concepts. The *uk-wool* (억울) refers to anger caused by victimizations, whereas the *boon* (분) refers to anger caused by an inability to defend against external occurrences (Min, 2008). Notably, these emotions refer directly to feelings of unfairness or injustice (Min, 2008; Cheon & Cesario, 2022).

These emotions represent a complex psychological state that can manifest as *hahn* (Min, 2008; Cheon & Cesario, 2022). The *hahn* (한) is a common psychological condition among Koreans, which is translated as "grudges, lamentation, grief, or [persistent experience of unfairness]" (Cheon & Cesario, 2022, p. 196). In addition, the *hahn* can be induced by *eungori* (응어리), which is interpreted as persistent negative emotions. These emotions may be connected to Korea's longstanding historical and sociocultural factors. Historically, Koreans experienced generations of discord due to protracted social and political strife, including Japan's colonization, the Korean War, social repression, and continuing oppression. These historical events have had severe

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[1] Relative implications but distinct concepts: Each emotion has a different meaning, but in the end, it is all related to hwa-byung. This may be emotions are influenced by external factors rather than internal factors. This is unlike basic emotions, which external or internal factors may influence. Based on emotions of "hwa, wool-hwa, boon, hahn," it may be focused with external factors (e.g., negative experience).

long-term consequences such as human rights violations, massive losses, severe distress[2],

dislocation and forced relocation, victimization, helplessness, alienation, and other

adverse consequences. Therefore, hwa-byung is explained as a cluster of psychological

forces associated with the underlying emotion of anger and resentment. Overall, these

occurrences created an environment and social consciousness that made individuals

vulnerable to the development of hwa-byung symptoms.

Several studies have demonstrated the types of symptoms related to hwa-byung.

Choi and colleagues (2021) described somatic symptoms, including a heat sensation, a

dry mouth, and respiratory stuffiness or chest pain (Choi et al., 2021; Suh et al., 2021;

Cheon & Cesario, 2022; Lee et al., 2023). Somatic symptoms also include swelling of

anger and a feeling of epigastrium mass. This may be related directly to *hahn*, including

persistent deeply embedded emotions. In addition, Choi et al. (2021) described

psychological symptoms as an outrage or frustration corresponding to *hwa* (i.e.,

*innermost fire*). Furthermore, Cheon and Cesario (2022) described that neurovegetative

symptoms include loss of energy, appetite, and weight loss. Lastly, Lee and colleagues

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[2] During Japanese colonialism (1910-1945), Koreans expressed deep sorrow for their living conditions in their own country under the Japanese dictatorship. Many Korean women, often referred to as Comfort Women, experienced sexual violence at the hands of Japanese soldiers. Many Korean men were forced to labor as mineworkers and forced to be soldiers (forced army withdrawal). Individuals had to speak Japanese and were not allowed to speak or write in Korean; only speaking and writing in Japanese were allowed. If individuals spoke Korean, then an extremely cruel situation would happen. Japanese individuals also examined the living human body for their cruel experiment, which was a biological experiment on Koreans. This is called the 731 Army, also known as Maruta. Many people were experimented on while still alive, and there is more history concerning our distress.

During the Korean War (6/25/1950-7/27/1953), the South and North fought for their own land and were separated (the Korean peninsula was cut in half along the 38th parallel). Several individuals were separated from their families as well as lost their homes and families. Individuals cannot determine whether their families are alive or not. During the Korean War, several Koreans relocated to Busan, South Korea. Individuals also came to South Korea with their infants or young children or even women were pregnant. Many parents could not feed their children because there was no food or shelter. Many women bear their children in the street and lose their children because of the bad conditions.

(2023) described that other symptoms include sighing (nonverbal expression of distress) or relationship concerns (as cited in Kim et al., 2014 & Min, 2009).

**Issues with the DSM-5 and Hwa-Byung**

The *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) classified hwa-byung as a Korean culture-bound syndrome in 1994 (Min & Suh, 2010; as cited in APA, 2000). The DSM-5 moved away from the notion of culture-bound syndromes and removed the word "bound" because it was too limiting geographically (Lewis-Fernández & Kirmayer, 2019, p. 787; Kasier & Weaver, 2019; American Psychiatric Association, 2022), and may result in the "exoticization" (Lewis-Fernández & Kirmayer, 2019, p. 787; Kasier & Weaver, 2019) and "otherization" of certain cultures. Instead, the DSM-5 describes *cultural concepts of distress*, referring to the ways cultural groups perceive and express emotional distress and behavioral concerns (APA, 2013, 2022). The DSM-5 distinguishes three types of cultural concepts: cultural syndromes, cultural idioms of distress, and cultural explanations or perceived causes of emotional and behavioral concerns. *Cultural syndromes* refer to clusters of symptoms that tend to co-occur in specific cultural groups and may be recognized as coherent experience patterns within cultures (APA, 2022). *Cultural idioms of distress* refer to shared ways to express distress. *Cultural explanations* refer to the culturally recognized meaning and etiology of symptoms and distress.

Hwa-byung is best conceptualized as a cultural syndrome in Koreans and Korean descent. Although the DSM-5 promotes the importance of culturally competent assessment ("cultural formation," APA, 2022, p. 860), it only listed ten cultural concepts ("Ataque de nervios, Dhat syndrome, Hikikomori, Khyâl cap, Kufungisisa, Maladi dyab,

Nervios, Shenjing shuairuo, Susto, Taijin kyofusho," APA, 2022, pp. 874–879)[3].

However, hwa-byung is not listed in the text, glossary, or index of the DSM-5. One

purpose of this study is to highlight the significance of hwa-byung in expanding cultural

competencies for clinicians, specifically American clinicians.

**History and Etiology of Hwa-Byung**

Keh-Ming Lin, a psychiatrist, first introduced hwa-byung as a culture-bound

syndrome in the United States (Lin, 1983). This study reported a case series of three

Korean Americans manifesting symptoms of hwa-byung. First, a 65-year-old woman,

caretaker for her daughter's son (Lin, 1983). She had a "sudden compression in her

epigastrium" (Lin, 1983, p. 105), shortness of breath, and fear of imminent death, as well

as extreme fatigue, "loss of appetite, and weight loss" (Lin, 1983, p. 106). Second, a 42-

year-old woman reported experiencing hwa-byung due to family relationship concerns

(Lin, 1983). Third, a 33-year-old woman reported a rapid onset of hwa-byung, which

coincided with immigrating to a new country (Lin, 1983). In fact, hwa-byung is most

typically discovered among women, particularly middle-aged women. Lin (1983)

described three cases that showed the psychosocial stressors in patients with hwa-byung,

which include immigrating to a new country, interpersonal conflicts, and other

circumstances. A literature review by Lin et al. (1992) indicated that Korean Americans

may be at increased risk of hwa-byung due to the "high levels of stress" (Lin et al., 1992,

p. 388) that they can be exposed to during their "initial phase of adjustment" (Lin et al.,

1992, p. 388).

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[3] The lists of cultural concepts (country or culture): Ataque de nervios (Latino descent), Dhat syndrome (South Asia), Hikikomori (Japan), Khyâl cap (Cambodia and Cambodians in the U.S.), Kufungisisa (Shona of Zimbabwe), Maladi dyab (Haiti), Nervios (Latin America), Shenjing shuairuo (China), Susto (Latinos in the United States, Central America, and South America), and Taijin kyofusho (Japan).

Dr. Lin also asserted that women may experience more severe hwa-byung than men (Lin, 1983). Historically, this may stem from the fact that Korean women have faced structurally embedded gender discrimination (Ketterer et al., 2010). In the traditional patriarchal system that has existed in Korea for centuries, Korean women were oppressed by men. This well-known patriarchy derived from Korean Confucian concepts is known as *Samjongjido* (삼종지도), which implies three obligations that women must follow. These obligations include women must obey their father's decision before marriage, their husband's decision after marriage, and their son's decision after their husband's death.

Another prominent patriarchy is *Chilgeojiak* (칠거지악), which outlines seven offenses that give the authority to banish a woman from her family. In other words, women can be removed from their families if they violate any of these rules. Some examples include disobedience to in-laws, the inability to bear sons, an inherited condition, or even jealousy. These oppressions can also lead to external conflicts, including marital conflicts, in-law conflicts, and other conflicts (Ketterer et al., 2010). One perception of hwa-byung is that historically rooted gender-based discrimination can heighten the risk of hwa-byung (Cheon & Cesario, 2022). Therefore, the study of hwa-byung in women is particularly beneficial in understanding this phenomenon.

As previously noted, Korean women may be at heightened risk for hwa-byung due to historical, social, and cultural conditions. In addition to these circumstances, Korean women with no outlet to express their anger and resentment may be at even greater risk. This pattern may be particularly prominent in middle-aged or older women, who suppress their anger to maintain stable relationships (Min et al., 2009). A literature review found that older women reported higher hwa-byung than any other age group

(Min & Suh, 2010). Consistent with prior findings (Min & Suh, 2010), Roberts and colleagues (2006) found that women had higher levels of hwa-byung than men. This previous study did not examine the association between hwa-byung and Americans, but examined the correlation between hwa-byung and Koreans. Kim et al. (2014) unexpectedly revealed that single individuals had significantly higher hwa-byung than married individuals. Due to the inconsistencies in the previous studies, the present study examined differences between younger and older generations. In addition, this study also examined the associations between hwa-byung and demographics (age, gender, and marital status) and explore a cross-cultural comparison between Korean and American individuals.

**Comorbidity with Psychopathologies**

American clinicians who work with Koreans or Korean Americans may benefit from a more detailed knowledge of Korean history and culture – specifically hwa-byung as a cultural concept of distress. Notably, the clinical indications of hwa-byung may be complicated due to comorbidity with other psychopathologies. Hwa-byung may be diagnosed with somatic disorders, adjustment to stress, personality problems, or even borderline personality (Cheon & Cesario, 2022). Consistent with research on comorbidity, Min and Suh (2010) demonstrated that hwa-byung may be diagnosed with major depressive disorder, generalized anxiety disorder, and somatoform disorder. In addition, Lin (1983) highlighted how hwa-byung could be associated with panic disorder, sleep disturbance, dysphoria, eating disorders, or major depressive disorder. Several researchers have drawn attention to similarities and overlapping symptoms of hwa-byung and depression. In fact, there are controversial discussions about whether hwa-byung

should be categorized under major depressive disorder (Lee et al., 2023; APA, 2013). However, these studies have merely demonstrated that hwa-byung may exhibit similar symptoms of depression.

In contrast to previous studies, some research showed that hwa-byung symptoms were distinct from depressive symptoms (Min et al., 2009). Therefore, the current study will examine the magnitude of the association between hwa-byung and major depressive disorder. In addition, Kim, Seo, Paik, and Sohn (2020) indicated that hwa-byung is associated with personality traits such as "being short-tempered, highly sensitive, timid, or perfectionistic" (Kim et al., 2020, p. 1085). Lee and colleagues (2012) showed that hwa-byung is distinct from major depressive disorder and demonstrated how specific symptoms of hwa-byung are closely associated with the self-transcendence scale from the Temperament and Character Inventory (TCI; Cloninger et al., 1993). To date, we are unaware of any studies that have examined the associations between hwa-byung and the Big Five personality traits. Therefore, the primary goal of this study is to investigate the association between hwa-byung and common comorbidities. Moreover, the current study will also expand on previous studies by examining the associations between hwa-byung, panic disorder, and obsessive-compulsive disorder.

**Prevalence**

The prevalence rates for hwa-byung previously reported ranged from 4.2% to 13.3% (Joe et al., 2017). The prevalence rate of middle-aged or older women who experienced hwa-byung is 4.95%. These statistics were higher in women with low socioeconomic status, living in rural settings, and divorced or separated (Park et al., 2002). Few studies reported that approximately 4.2% of the general population in Korea

(Park et al., 2002; as cited in Min et al., 1990) and approximately 11.9% of Korean American individuals may have clinically significant levels of hwa-byung (Park et al., 2002; Lin et al., 1992). These prevalence statistics may be underestimated due to the restricted familiarity with hwa-byung. In addition, there are fewer studies on the cultural concept of distress, specifically hwa-byung. Several previous studies have solely been conducted to determine whether there are similarities between hwa-byung and anger as well as correlations between hwa-byung with psychological and somatic symptoms.

Remarkably, few studies have examined how hwa-byung may be associated with personality and how personality may be impacted by hwa-byung. The Western perspective on anger may often be considered an emotional condition, while hwa-byung is a complex emotion distinct from commonly recognized anger in Korea. These studies lack an in-depth review of hwa-byung across cultures. Park and colleagues (2015) described an inconsistency between Western and Korean traditional medicine on hwa-byung. Western physicians may consider hwa-byung a cluster of unrelated symptoms, whereas traditional Korean medicine may center on a *hwa* (Park et al., 2015). The current study aims to support the expansion of reliable methodology to evaluate hwa-byung.

**Current Study**

The current study examined the relationship between hwa-byung, the Big Five personality traits, and psychological conditions (i.e., insomnia, anxiety, and depression). This study will also explore the relationship between hwa-byung and demographic variables. Data was obtained from a sample of Koreans (from South Korea) as well as American college students, Koreans, and Korean Americans living in the United States. We propose the following hypotheses.

1) Koreans and Korean Americans would score higher on a measure of hwa-byung than Americans.

2) Demographic variables such as age, marital status, and treatment history would have significant correlations with hwa-byung and hwa-byung subscales.

   a. The older age generation would strongly correlate with all hwa-byung than younger age. Older participants would endorse higher levels of hwa-byung symptoms than younger.

   b. Married women would experience be more severe hwa-byung than married men.

   c. Individuals who either received psychotherapy or took medication would strongly report higher levels of hwa-byung symptoms than participants with no past mental health treatment.

3) Hwa-byung, sleep disturbance, and pathologies (i.e., anxiety and depression) will all be positively correlated with each other.

4) Hwa-byung will show differential patterns of correlation with the Big Five for personality trait dimensions.

   a. Hwa-byung would strongly correlate neuroticism and agreeableness but also negatively correlate openness and extraversion.

   b. Hwa-byung would not correlate with conscientiousness.

**METHOD**

**Participants**

A total of 328 participants from South Korea and the United States were recruited in this study. Native Korean speakers comprised 82 women and 68 men participants (*n* = 150) aged between 20 to 77. In South Korea, Korean participants were recruited by contacting individuals in various organizations and settings (e.g., workplaces, public organizations) and by snowball sampling, direct in-person appeal, and word-of-mouth. We omitted one participant who repeated the questionnaire. Overall, 149 participants were in the Korean sample. In the United States, we recruited a total of 178 American college students (native English speakers) from St. John's University aged between 17 to 34, with genders consisting of the following: 135 women, 40 men, two non-binary individuals, and one preferred not to inform their gender. Only five Korean or Korean American participants were recruited from the University. As such, these participants were dropped from the data analysis reported herein. The current study was approved by the St. John's University Institutional Review Board (IRB). Participants were provided informed consent by signing the consent form before completing the questionnaire in Qualtrics or hard copies of the survey. Overall, a total of 322 participants provided adequate data that was analyzed and reported in this study.

**Procedure**

The current study used three translated and four back-translated questionnaires for Korean participants. The methodology of *back-translation* refers to translating an original language into another language and then reversing the process (Klotz et al., 2023). In terms of back-translation, four assessments (sleep disturbance, panic disorder, obsessive-

compulsive disorder, and social phobia) were translated into Korean and three assessments (except sleep disturbance) were back-translated from Korean into English. Firstly, two translation services were applied to translate into Korean. Secondly, the Language Center at the South Korean University (KAIST) back-translated from Korean into English and the investigator back-translated from English into Korean. Lastly, the investigator's family, who were native Korean speakers reviewed and corrected Korean translations.

***Procedures for Korean Participants***

The survey began with the informed consent (written in Korean), in which they signed and dated the consent form. Korean participants were college students, employees, and self-employees (Seoul, South Korea) who completed the printed surveys, taking approximately 30 minutes. Participants were asked to provide demographics, including age, gender, and marital status. Participants were also asked to provide their psychiatric history, including if they have ever been in psychotherapy or taken any psychiatric medication. In addition, participants were asked to respond to one packet (with seven questionnaires) with a pen.

Demographic data collection was followed by Hwa-Byung Scale (Choi & Yeom, 2011), Mini International Personality Item Pool (IPIP; Donnellan et al., 2006), Patient-Reported Outcomes Information System (PROMIS) eight items from the Adult Sleep Disturbance (APA, 2013), and the Psychiatric Diagnostic Screening Questionnaire (PDSQ; Zimmerman, 2002) subscales for panic disorder, obsessive-compulsive disorder, social phobia, and major depressive disorder. Lastly, participants received compensation, approximately a $5 Starbucks gift card.

*Procedures for American Participants*

American participants obtained informed consent (written in English) and participated after providing their agreement on the consent form. Participants were college students at St. John's University (New York, United States) who completed an online survey on Qualtrics which took approximately 30 minutes. Participants provided demographics, including age, gender, marital status, and academic status. Participants reported their race and/or ethnicity as well as if they were identified as Korean. In addition, participants were asked to provide their psychiatric history, including if they have ever been in psychotherapy or taken any psychological-related medication. Participants responded to the seven randomized surveys (previously listed) on Qualtrics. Participants then provided their SONA ID to receive their course credits, and received an equivalent debriefing form at the end of the survey.

**Assessment Instruments**

*Hwa-Byung Scale*

The hwa-byung scale was developed by several studies to measure hwa-byung symptoms (Choi & Yeom, 2011). This scale contained 31 Likert items (Choi & Yeom, 2011), but one item about whether participants had less or no interest in sexual intercourse was omitted. The item on sexual activity was excluded from the total hwa-byung score for the American sample to maintain scale equivalence for both samples. Therefore, we measured 30 items in both Korean and American participants. Some of the items include whether individuals had hot flashes, felt persecuted, felt depressed (See Appendix C). Although each participant completed the hwa-byung scale, they were provided distinct assessment terminology based on their nationality. American

participants were guided, "Please check on each item to describe your experience during the last month." Participants evaluated the six-point Likert scale as follows: (5) *Always*, (4) *Frequently*, (3) *Often*, (2) *Sometimes*, (1) *Rarely*, and (0) *Never*. However, Korean participants were instructed in Korean, "Please check on each item to describe your experience during the last week or month" (최근 몇주 또는 몇달 동안 자신에 대해 어떻게 느끼고 있는지 해당하는 부분에 체크해 주세요). Participant rated each question on a six-point Likert scale as follows: 5) *Strongly Agree*, (4) *Somewhat Agree*, (3) *Neutral*, (2) *Disagree*, (1) *Somewhat Disagree*, and (0) *Strongly Disagree*. This was different for Korean participants to make it easier to comprehend.

The hwa-byung scale also includes three subscales which are labeled psychological, cardiovascular, and somatic symptoms. These subscales were created using a rational-theoretic method by the principal investigator. The psychological subscale score was calculated as a total of items 1 through 19, 23, 27. These subscales indicated whether individuals felt regret, enraged, or depressed. In addition, the cardiovascular subscale score was evaluated as the total of items 20 through 22, and 30. This subscale includes sighing, chest tightness, or unable to tolerate a hot bath or a hot room temperature. Lastly, the somatic subscale score was computed as the total of 24 through 26, 28, and 29. This subscale includes symptoms of heart pounding, headaches, or tiredness.

The total scores of hwa-byung scales can range from 5 to 150. Choi and Yeom (2011) described how high scores represent more severe of hwa-byung symptoms (See also Choi et al., 2009). In the Korean sample, Cronbach's alphas yielded were the following: hwa-byung total scale ($\alpha$ = .963), psychological ($\alpha$ = .953), cardiovascular ($\alpha$

= .772), and somatic (α = .869). This indicated the internal consistency ranged from acceptable to excellent. In the American sample, Cronbach's alphas generated were the following: hwa-byung total scale (α = .967), psychological subscale (α = .960), cardiovascular subscale (α = .804), and somatic subscale (α = .841), ranging from acceptable to excellent.

### Mini International Personality Item Pool (IPIP)

The Mini International Personality Item Pool (IPIP; Donnellan et al., 2006) is a self-reported questionnaire comprising 20 items. This assessment originated from a shortened version of the International Personality Item Pool–Five Factor Model (IPIP-FFM; Goldberg, 1999), consisting of 50 items. The official website for the IPIP's Korean translation of the Lexical Big-Five Factor Markers as used to match each item for Mini-IPIP (Oh et al., 2020). Participants responded to questions: 1) I sympathize with others' feelings, 2) I like order, and 3) I am not interested in abstract ideas (See Appendix D). Each participant rated how much each item described them using a 5-point Likert scale, ranging from (0) *Strongly Disagree* to (4) *Strongly Agree*.

The IPIP items are classified into five subscales: Extraversion (e.g., *life of the party*), Agreeableness (e.g., *sympathizing with others' feelings*), Conscientiousness (e.g., *getting chores done right away*), Neuroticism (e.g., *have frequent mood swings*), and Openness (e.g., *have a vivid imagination*). This scale also assessed the factor analysis and revised the conscientiousness and openness subscales (Donnellan et al., 2006). Each subscale included two reverse-scored items, and the openness subscale contained three reverse scored items. The Mini-IPIP total score was calculated by summing openness, extraversion, agreeableness, and conscientiousness and subtracting neuroticism. In the

Korean sample, the internal reliability for the Mini-IPIP is represented with the following

Cronbach's alphas: Mini-IPIP total scale ($\alpha$ = .712), Extraversion ($\alpha$ = .665),

Agreeableness ($\alpha$ = .645), Conscientiousness ($\alpha$ = .699), Neuroticism ($\alpha$ = .462), and

Openness ($\alpha$ = .569). IPIP subscales indicated internal consistency ranged from poor to

good. In the American sample, the internal reliability for the Mini-IPIP is demonstrated

with the following Cronbach's alphas: Mini-IPIP total scale ($\alpha$ = .674), Extraversion ($\alpha$

= .800), Agreeableness ($\alpha$ = .649), Conscientiousness ($\alpha$ = .561), Neuroticism ($\alpha$ = .448),

and Openness ($\alpha$ = .594). The Mini-IPIP and its subscales showed the internal

consistency ranging from good to questionable. However, internal consistency for the

neuroticism subscale was very poor.

### *Sleep Disturbance*

The Patient-Reported Outcomes Measurement Information System (PROMIS;

National Institute of Health, n.d.) is a patient-reported outcome instrument for clinical

and research settings containing measures to evaluate a variety of conditions among

individuals experiencing persistent medical conditions (National Institute on Aging, n.d.).

The PROMIS Sleep Disturbance scale is an eight-item self-report on sleep habits and

sleep quality in the last seven days (Full et al., 2019; APA, 2013). The questions are on a

5-point Likert scale ranging from *Not at All* to *Very Much*, *Never* to *Always*, and *Very*

*Poor* to *Very Good*. All participants rated each item about their sleep habits and sleep

quality in the past seven days (See Appendix E). Total sleep disturbance scale score

range from 8 to 40, where higher scores indicate more severe sleep disturbance. In the

Korean sample, Cronbach's alpha for the sleep disturbance scale was 0.893. In the

American sample, Cronbach's alpha for the sleep disturbance scale was 0.885.

***Psychiatric Diagnostic Screening Questionnaire (PDSQ)***

The Psychiatric Diagnostic Screening Questionnaire (PDSQ; Zimmerman, 2002) is a self-report instrument established by clinical researchers to assess individuals in outpatient clinical settings for common DSM-IV axis I disorders (Zimmerman & Mattia, 2001). There are thirteen scales on the original PDSQ. The current study used four subscales (panic disorder, obsessive-compulsive disorder, social phobia, and major depressive disorder). The PDSQ developers reported good to excellent internal consistency, reliability, and validity for all subscales (Zimmerman & Mattia, 2001).

In the Korean sample, Cronbach's alphas for the PDSQ total score ($\alpha = .924$), panic disorder ($\alpha = .856$), social phobia ($\alpha = .889$), major depressive disorder ($\alpha = .880$) were good to excellent. Internal reliability for the PDSQ obsessive-compulsive disorder ($\alpha = .584$) score was below what is usually considered psychometrically acceptable. In the American sample, Cronbach's alphas for PDSQ total score ($\alpha = .934$), panic disorder ($\alpha = .857$), social phobia ($\alpha = .871$), obsessive-compulsive disorder ($\alpha = .825$), and major depressive disorder ($\alpha = .901$). PDSQ psychopathology scores showed the internal consistency ranged from good to excellent.

**Panic Disorder.** The PDSQ Panic Disorder scale consisted of eight items, including whether individuals were worried a lot about having unexpected panic attacks, or intense anxiety or fear attacks without any reason at all (See Appendix F). Questions also probed for specific cognitive, affective, and physiological symptoms of panic such as shortness of breath, racing heart and sweating. Instructions in English were, "Please select *Yes* if this describes you in the past two weeks, including today." However, instructions in Korean applied slightly different terminology.

**Obsessive-Compulsive Disorder (OCD).** The PDSQ OCD scale contained seven questions such as: 1) Did you worry obsessively about dirt, germs, or chemicals? 2) Did you wash and clean yourself or things around you obsessively and excessively? and 3) Did you count things obsessively and excessively? (See Appendix G). Each participant responded *Yes* if the question or symptom was true for them in the last two weeks, including today.

**Social Phobia.** The PDSQ Social Phobia is also known as Social Anxiety Disorder (SAD). This scale comprised eight items, including six sub-items (15 items in total). Some of the questions were about fear of common anxiety-provoking situations like public speaking, business meetings, eating in front of others, and asking a question when in a group of people. Participants rated *Yes* if questions described them in the past six months, including today (See Appendix H).

**Major Depressive Disorder (MDD).** The PDSQ MDD scale refers to the PDSQ depression scale. This scale consisted of 21 items containing content relevant to symptoms that occur during depressive episodes, including questions about mood (felt sad or depressed), changes in appetite, fatigue, and sleep disturbance (See Appendix I). The instructions were: "Please check the *Yes* column if this describes you in the past two weeks, including today." In addition, the major depressive disorder items (Lee et al., 2013) were translated to Korean participants.

**Coding Issues and Data Analyses**

The current study was performed by operating the SPSS 27 version to conduct all statistical analyses (IBM, 2020). We measured the frequencies and descriptive statistics of participants' demographics. Pearson's *r* correlation analyses were conducted to specify

the strength of the relationship between hwa-byung, personality, and psychological distress (i.e., insomnia, anxiety and depression). These measured our third and fourth (4a, 4b) hypotheses to see which strongly correlates, negatively correlates, or even has no correlation. T-tests were utilized to compare groups (single vs. married). Effect sizes were estimated. These analyses were utilized in our first and second (2a, 2b, 2c) hypotheses to see whether there are differences between groups on our measure of hwa-byung. We were unable to obtain data on the marital status or relationship status of the American sample.

We looked at the possibility of differences in hwa-byung based on demographic features (e.g., age, gender). Several variables were dummy-coded. In the Korean sample, the investigator coded gender and marital status as follows: "1" as *male* and "2" as *female* and "0" as *single,* and "1" as *married*. In the American sample, the investigator coded gender and marital status as follows: "1" as *female* and "2" as *male* and "0" as *single,* and "1" as *never married*. Whether or not participants received psychotherapy or had taken psychiatric medication was also dummy-coded, "0" as *no* and "1" as *yes*, and the same dummy coding procedure was used for the American participants.

We also classified participants according to their ages. We used syntax commands and coded "1" as *17 to 29 years old*, "2" as *30 to 39 years old*, "3" as *40 to 49 years old*, "4" as *50 to 59 years old*, and "5" as *60 years or older* participants. We also classified "0" as *American participants* and "1" *Korean participants*. The confidence interval percentage was 95%, and effect size was estimated. These measured our first and second (2a, 2b, 2c) hypotheses to examine the distinctions between hwa-byung groups on our hwa-byung assessment.

# RESULTS

## Descriptive Statistics

### *Participants' Demographics*

The current study obtained 322 participants, which included 149 Koreans (46.3%) and 173 Americans (53.7%). One hundred and forty-nine *Korean participants* reported their age, which ranged from 20 to 77 ($M = 43.2$, $SD = 14.5$). Korean participants reported their gender as 81women (54.4%) and 68 men (45.6%). Participants also reported their marital status as follows: 55 participants were single (36.9%), 85 participants were married (57%), two participants were never married (1.3%), three participants were divorced (2%), three participants were widowed (2%), and one participant provided an invalid response (0.7%). In addition, we did not ask about their educational background because it may have inconvenienced several individuals. Twenty participants reported that they had received psychotherapy or taken psychiatric medication (13.4%). One hundred and twenty-nine participants reported *not* having a psychiatric record (86.6%).

One hundred and five *American participants* reported their age, which ranged from 17 to 34 ($M = 19.2$, $SD = 1.9$). Sixty-eight participants did not report their age (39.3%). American participants reported their gender as 132 females (76.3%), 39 males (22.5%), one non-binary or third gender (0.6%), and one participant preferred not to inform their gender (0.6%). Participants also identified as 74 Caucasian (42.8%), 28 Black or African American (16.2%), 22 Asian (12.7%), 20 Multiracial (11.6%), 24 Other Race or Ethnicity (13.9%), and only five participants identified as Korean (2.9%). Sixty-four participants were reported as freshmen (37%), 65 sophomores (37.6%), 21 juniors

(12.1%), 21 seniors (12.1%), and two graduate students (1.2%). One hundred and forty-five participants reported their marital status as single (83.8%), 27 participants reported as never married (15.6%), and one participant provided an invalid response (0.6%). Data on marital status and relationship status in the American sample was not collected. Lastly, 51 participants reported that they had received psychotherapy or taken psychiatric medication (29.5%). One hundred and twenty-two participants reported *not* having a psychiatric record (70.5%). Overall, all participants' demographics are presented in Table 1.

**Table 1**

*Participants' Demographics*

| Characteristics | ROK ($N = 149$) | | USA ($N = 173$) | | TOTAL ($N = 322$) | |
|---|---|---|---|---|---|---|
| | $n$ | % or M ($SD$) | $n$ | % or M ($SD$) | $n$ | % or M ($SD$) |
| Age | 149 | 43.2 (14.5) | 105 | 19.2 (1.9) | 254 | 33.3 (16.3) |
| Gender | | | | | | |
| Female | 81 | 54.4% | 132 | 76.3% | 213 | 66.1% |
| Male | 68 | 45.6% | 39 | 22.5% | 107 | 33.2% |
| Non-Binary/Third Gender | | | 1 | 0.6% | 1 | 0.3% |
| Prefer Not to Say | | | 1 | 0.6% | 1 | 0.3% |
| Marital Status | | | | | | |
| Single | 55 | 36.9% | 145 | 83.8% | 200 | 62.1% |
| Never Married | 2 | 1.3% | 27 | 15.6% | 29 | 9% |
| Married | 85 | 57% | | | 85 | 26.4% |
| Divorced | 3 | 2% | | | 3 | 0.9% |
| Widowed | 3 | 2% | | | 3 | 0.9% |
| Missing | 1 | 0.7% | 1 | 0.6% | 2 | 0.6% |
| Race/Ethnicity | | | | | | |
| Caucasian | | | 74 | 42.8% | 74 | 23% |
| Black/African American | | | 28 | 16.2% | 28 | 8.7% |
| East Asian (Korean) | | | 5 | 2.9% | 154 | 47.8% |
| Asian | | | 22 | 12.7% | 22 | 6.8% |
| Multiracial | | | 20 | 11.6% | 20 | 6.2% |
| Other | | | 24 | 13.9% | 24 | 7.5% |

| | ROK n | ROK % | USA n | USA % | TOTAL n | TOTAL % |
|---|---|---|---|---|---|---|
| Academic Status | | | | | | |
| Freshman | | | 64 | 37% | 64 | 19.9% |
| Sophomore | | | 65 | 37.6% | 65 | 20.2% |
| Junior | | | 21 | 12.1% | 21 | 6.5% |
| Senior | | | 21 | 12.1% | 21 | 6.5% |
| Graduate | | | 2 | 1.2% | 2 | 0.6% |
| Omitted | | | | | 149 | 46.3% |
| Psychiatric Records | | | | | | |
| Yes | 20 | 13.4% | 51 | 29.5% | 71 | 22% |
| No | 129 | 86.6% | 122 | 70.5% | 251 | 78% |

*Note.* *n* = Sample size; M = Mean; *SD* = Standard Deviation; ROK = Republic of Korea; USA = United States of America; TOTAL = All participants demographics; Omitted = Omitted items in the Korean version of questionnaire. Psychiatric Records = Participants had received psychotherapy and/or taken psychiatric medication (YES) and participants reported *not* having a psychiatric record (NO).

### *Geographical Differences*

In terms of geographic differences, *Korean participants* reported on average higher hwa-byung ($M = 57.4$, $SD = 30.8$) than *American participants* ($M = 48.8$, $SD = 29.9$). An independent t-test showed that the mean score of Korean participants was slightly higher, $t(320) = 2.53$, $p = .012$, $d = 0.28$ (See Figure 1 in Appendix A).

### *Comparisons of Means*

**Age Differences.** The current study classified *Korean participants* into five age groups: the *first group* ranged from 20 to 29, the *second group* ranged from 30 to 39, the *third group* ranged from 40 to 49, the *fourth group* ranged from 50 to 59, and the *fifth group* aged sixty years or older (See Table 2).

However, this study classified *American participants* into only two groups: the *first group* ranged from 17 to 29 and the *second group* ranged from 30 to 39. Seventy-four participants (42.8%) did not provide their age (See Table 3). Overall, we only calculated the means and did not evaluate the independent t-test (See also Figure 2 in Appendix B).

**Table 2**

*Age Differences in the Korean Sample*

| | Age Groups | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Group 1 (*N* = 32) | | Group 2 (*N* = 38) | | Group 3 (*N* = 17) | | Group 4 (*N* = 38) | | Group 5 (*N* = 24) | |
| Items | Mean | *SD* | Mean | *SD* | Mean | *SD* | Mean | *SD* | Mean | *SD* |
| Hwa-Byung | 51.1 | 31.8 | 44.3 | 31.3 | 72.2 | 22.8 | 44.3 | 30.1 | 46.3 | 27.3 |

*Note.* $N$ = 149; SD = Standard Deviation; Age ranged from 20 to 77 ($M$ = 49.3, $SD$ = 30.5); Group 1 = Ages 20 to 29; Group 2 = Ages 30 to 39; Group 3 = Ages 40 to 49; Group 4 = Ages 50 to 59; Group 5 = 60 years old or older.

**Table 3**

*Age Differences in the American Samples*

| | Age Groups | | | | | |
|---|---|---|---|---|---|---|
| | Group 1 (N = 98) | | Group 2 (N = 1) | | N/A (N = 74) | |
| Items | Mean | *SD* | Mean | *SD* | Mean | *SD* |
| Hwa-Byung | 58.4 | 29.2 | 10 | . | 53 | 31.5 |

*Note.* $N$ = 173; SD = Standard Deviation; Age ranged from 17 to 34 ($M$ = 55.8, $SD$ = 30.3); Group 1 = Ages 17 to 29; Group 2 = Ages 30 to 39; N/A = Participants who did not provide their age.

**All Participants.** Pearson correlations evaluated the relationship between hwa-byung and age. Hwa-byung was negatively correlated with age ($r$ = -0.13, $p < 0.05$). See Table 4.

**Table 4**

*Correlation Between Hwa-Byung and Age*

| Items | Mean | SD | Age | Hwa-Byung |
|---|---|---|---|---|
| Age | 33.3 | 16.3 | – | |
| Hwa-Byung | 52.8 | 30.6 | -.128[*] | – |

*Note.* $N$ = 322; SD = Standard Deviation; *group difference significant at $p < 0.05$.

**Gender.** Concerning the *Korean participants*, the mean hwa-byung for women was 55.8 ($SD$ = 29.7) and the mean hwa-byung for men was 41.5 ($SD$ = 29.8). Women reported psychological ($M$ = 38.2, $SD$ = 21.4), cardiovascular ($M$ = 8.2, $SD$ = 4.6), and somatic symptoms ($M$ = 9.4, $SD$ = 5.9). Hwa-byung subscale scores for men were

psychological ($M = 29.4$, $SD = 21.7$), cardiovascular ($M = 5.9$, $SD = 4.5$), and somatic symptoms ($M = 6.2$, $SD = 5.7$).

Due to missing data, two *American participants* were omitted in the study (1.2%). The mean hwa-byung for women was 57.8 ($SD = 30.2$) and the mean hwa-byung for men was 47.6 ($SD = 29.8$). In addition, women reported psychological ($M = 42.1$, $SD = 21.9$), cardiovascular ($M = 5.9$, $SD = 4.4$), and somatic symptoms ($M = 9.8$, $SD = 5.8$). Hwa-byung subscale scores among men were psychological ($M = 36.3$, $SD = 21.7$), cardiovascular ($M = 4.1$, $SD = 4.2$), and somatic symptoms ($M = 7.2$, $SD = 5.2$). These results appear in Table 5.

**Table 5**

*Compared Means of Gender Across Diagnostic Criteria*

| | Gender | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ROK | | | | USA | | | |
| | Female (N = 81) | | Male (N = 68) | | Female (N = 132) | | Male (N = 39) | |
| Items | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Hwa-Byung | 55.75 | 29.74 | 41.50 | 29.82 | 57.83 | 30.15 | 47.56 | 29.78 |
| Psychological | 38.16 | 21.41 | 29.38 | 21.70 | 42.07 | 21.94 | 36.28 | 21.68 |
| Cardiovascular | 8.16 | 4.55 | 5.94 | 4.57 | 5.93 | 4.37 | 4.10 | 4.19 |
| Somatic | 9.43 | 5.90 | 6.18 | 5.73 | 9.83 | 5.82 | 7.18 | 5.21 |

*Note.* $N = 320$; $SD$ = Standard Deviation; ROK = Republic of Korea ($N = 149$); USA = United States of America ($N = 171$).

**Marital Status.** Given that this study focused on the distinctions between single and married couples, only Korean participants were measured. In addition, nine participants were omitted in this study due to missing data (6%). The single individuals in the Korean sample reported a mean hwa-byung score of 49.8 ($SD = 33$). Single Korean participants' hwa-byung subscale scores were psychological ($M = 34.7$, $SD = 24.4$), cardiovascular ($M = 6.9$, $SD = 4.4$), and somatic symptoms ($M = 8.3$, $SD = 6.8$). Married

participants reported hwa-byung ($M = 49.4$, $SD = 29.6$). Married individuals also reported psychological ($M = 34$, $SD = 20.8$), cardiovascular ($M = 7.5$, $SD = 4.9$), and somatic symptoms ($M = 7.9$, $SD = 5.67$). These results appear in Table 6.

**Table 6**

*Compared Means of Marital Status Across Diagnostic Criteria*

| | Marital Status | | | |
| | Single (N = 55) | | Married (N = 85) | |
| Items | Mean | SD | Mean | SD |
|---|---|---|---|---|
| Hwa-Byung | 49.84 | 32.97 | 49.36 | 29.59 |
| Psychological | 34.71 | 24.43 | 34.04 | 20.75 |
| Cardiovascular | 6.85 | 4.36 | 7.47 | 4.91 |
| Somatic | 8.27 | 6.80 | 7.86 | 5.67 |

*Note.* $N = 312$; $SD$ = Standard Deviation; ROK = Republic of Korea ($N = 140$); USA = United States of America ($N = 172$).

**Psychiatric History.** *Korean participants* with a prior history of treatment reported a mean hwa-byung score of ($M = 62.7$, $SD = 34.4$), and the following subscale mean scores psychological ($M = 44$, $SD = 25$), cardiovascular ($M = 8.3$, $SD = 4.7$), and somatic symptoms ($M = 10.5$, $SD = 6.4$). Korean participants with no treatment history had a mean hwa-byung score of ($M = 47.2$, $SD = 29.5$), and subscale scores of psychological ($M = 32.6$, $SD = 21.1$), cardiovascular ($M = 7$, $SD = 4.7$), and somatic symptoms ($M = 7.6$, $SD = 5.9$).

*American participants* who had received treatment reported a mean hwa-byung of ($M = 66.5$, $SD = 34.4$), psychological ($M = 48.8$, $SD = 25.2$), cardiovascular ($M = 6.4$, $SD = 4.7$), and somatic symptoms ($M = 11.8$, $SD = 6.5$). American participants with no treatment history also reported a mean hwa-byung of ($M = 51.4$, $SD = 27.3$), and subscale means scores as follows: psychological ($M = 37.7$, $SD = 19.7$), cardiovascular ($M = 5.2$, $SD = 4.2$), and somatic symptoms ($M = 8.4$, $SD = 5.2$). (See Table 7).

**Table 7**

*Compared Means of Psychiatric History Across Diagnostic Criteria*

| | Psychiatric History | | | | | | | |
| | ROK | | | | USA | | | |
| | Yes (*N* = 20) | | No (*N* = 129) | | Yes (*N* = 51) | | No (*N* = 122) | |
| Items | Mean | *SD* | Mean | *SD* | Mean | *SD* | Mean | *SD* |
|---|---|---|---|---|---|---|---|---|
| Hwa-Byung | 62.70 | 34.36 | 47.16 | 29.48 | 66.47 | 34.59 | 51.35 | 27.32 |
| Psychological | 43.95 | 24.94 | 32.64 | 21.11 | 48.82 | 25.24 | 37.73 | 19.70 |
| Cardiovascular | 8.25 | 4.73 | 6.98 | 4.67 | 6.37 | 4.69 | 5.19 | 4.22 |
| Somatic | 10.50 | 6.41 | 7.55 | 5.90 | 11.27 | 6.51 | 8.43 | 5.24 |

*Note. N* = 322. *SD* = Standard Deviation. ROK = Republic of Korea (*N* =149). USA = United States of America (*N* = 173).

## Analyses of Statistics

### Independent Samples t-test

**Gender.** An independent t-test to compare hwa-byung and hwa-byung subscales among women and men across cultures. Concerning *Korean participants*, this study discovered the mean score of women was significantly higher, $t(147) = -2.91$, $p = .004$, $d = -0.48$, with a medium effect size (See Table 8). Regarding the *American participants*, this study found the mean score of women was higher than that of men but not to a statistically significant degree, $t(169) = 1.87$, $p = 0.06$, $d = 0.34$. (See Table 9).

**Table 8**

*Differences Between Females and Males on Hwa-Byung and Its Subscales in the Korean Sample*

| | ROK | | | | | | |
| | Female (*N* = 81) | | Male (*N* = 68) | | *t* | Sig. | *d* |
| Items | Mean | *SD* | Mean | *SD* | | | |
|---|---|---|---|---|---|---|---|
| Hwa-Byung | 55.75 | 29.74 | 41.50 | 29.82 | -2.91 | .004 | -0.48 |
| Psychological | 38.16 | 21.41 | 29.38 | 21.70 | -2.48 | .014 | -0.41 |
| Cardiovascular | 8.16 | 4.55 | 5.94 | 4.57 | -2.96 | .004 | -0.49 |
| Somatic | 9.43 | 5.90 | 6.18 | 5.73 | -3.40 | .001 | -0.60 |

*Note. N* = 149. ROK = Republic of Korea. *SD* = Standard Deviation; *t* = T Score; Sig. = P-Value (Two-Tailed); *d* = Cohen's d (Effect Size).

**Table 9**

*Differences Between Females and Males on Hwa-Byung and Its Subscales in the American Sample*

| | USA | | | | $t$ | Sig. | $d$ |
|---|---|---|---|---|---|---|---|
| | Female (N = 132) | | Male (N = 39) | | | | |
| Items | Mean | SD | Mean | SD | | | |
| Hwa-Byung | 57.83 | 30.15 | 47.56 | 29.78 | 1.87 | .06 | 0.34 |
| Psychological | 42.07 | 21.94 | 36.28 | 21.68 | 1.45 | .15 | 0.26 |
| Cardiovascular | 5.93 | 4.37 | 4.10 | 4.19 | 2.32 | .02 | 0.42 |
| Somatic | 9.83 | 5.82 | 7.18 | 5.21 | 2.55 | .01 | 0.47 |

*Note. N* = 171. USA = United States of America. *SD* = Standard Deviation; *t* = T Score; Sig. = P-Value (Two-Tailed); *d* = Cohen's d (Effect Size).

**Marital Status.** An independent samples t-test was conducted to compare hwa-byung symptom levels by marital status. Unexpectedly, this study found that single Korean participants scored higher on total hwa-byung and the psychological and somatic symptom hwa-byung subscales. Married Koreans scored higher on the cardiovascular symptoms subscale of the hwa-byung scale. None of the differences between married and single participants was statistically significant, all with very low effect sizes. (See Table 10).

**Table 10**

*Differences in Marital Status on Hwa-Byung and Its Subscales in the Korean Sample*

| | Marital Status | | | | $t$ | Sig. | $d$ |
|---|---|---|---|---|---|---|---|
| | Single (N = 55) | | Married (N = 85) | | | | |
| Items | Mean | SD | Mean | SD | | | |
| Hwa-Byung | 49.84 | 32.97 | 49.36 | 29.59 | 0.09 | .93 | 0.02 |
| Psychological | 34.71 | 24.43 | 34.04 | 20.75 | 0.18 | .86 | 0.03 |
| Cardiovascular | 6.85 | 4.36 | 7.47 | 4.91 | -0.76 | .45 | -0.13 |
| Somatic | 8.27 | 6.80 | 7.86 | 5.67 | **0.38[a]** | **.71** | **0.07** |

*Note. N* = 149. *SD* = Standard Deviation; *t* = T Score; Sig. = P-Value (Two-Tailed); *d* = Cohen's d (Effect Size). [a] = The bolded number are indicated as "equal variances not assumed" (IBM, 2020).

**Psychiatric History.** An independent t-test was conducted to compare psychiatric history for hwa-byung and its symptoms. Concerning *Korean participants*, this study

discovered that the participants who received psychotherapy or taken psychiatric medication had higher mean hwa-byung, $t(147) = -2.14$, $p = 0.03$, $d = -0.51$, with a medium effect size (See Table 11). Regarding the *American participants*, those who had received previous treatment scored higher on hwa-byung, but the difference was not statistically significant. (See Table 12).

**Table 11**

*Differences in Psychiatric History on Hwa-Byung and Its Subscales in the Korean Sample*

| | ROK | | | | | | |
|---|---|---|---|---|---|---|---|
| | Yes (N = 20) | | No (N = 129) | | $t$ | Sig. | $d$ |
| Items | Mean | SD | Mean | SD | | | |
| Hwa-Byung | 62.70 | 34.36 | 47.16 | 29.48 | -2.14 | .03 | -0.52 |
| Psychological | 43.95 | 24.94 | 32.64 | 21.11 | -2.18 | .03 | -0.52 |
| Cardiovascular | 8.25 | 4.73 | 6.98 | 4.67 | -1.13 | .26 | -0.27 |
| Somatic | 10.50 | 6.41 | 7.55 | 5.90 | -2.06 | .04 | -0.5 |

*Note.* $N = 149$. ROK = Republic of Korea. *SD* = Standard Deviation; $t$ = T Score; Sig. = P-Value (Two-Tailed); $d$ = Cohen's d (Effect Size).

**Table 12**

*Differences in Psychiatric History on Hwa-Byung and Its Subscales in the American Sample*

| | USA | | | | | | |
|---|---|---|---|---|---|---|---|
| | Yes (N = 51) | | No (N = 122) | | $t$ | Sig. | $d$ |
| Items | Mean | SD | Mean | SD | | | |
| Hwa-Byung | 66.47 | 34.59 | 51.35 | 27.32 | **-2.78[a]** | **.007** | **-0.51** |
| Psychological | 48.82 | 25.24 | 37.73 | 19.70 | **-2.80[b]** | **.006** | **-0.52** |
| Cardiovascular | 6.37 | 4.69 | 5.19 | 4.22 | -1.63 | .106 | -0.27 |
| Somatic | 9.27 | 6.51 | 8.43 | 5.24 | -3.02 | .003 | -0.50 |

*Note.* $N = 173$. USA = United States of America. *SD* = Standard Deviation; $t$ = T Score; Sig. = P-Value (Two-Tailed); $d$ = Cohen's d (Effect Size). [a & b] = The bolded number are indicated as "equal variances not assumed" (IBM, 2020).

## *Correlations*

**Korean Participants.** Pearson correlations evaluated the relationship between hwa-byung, sleep disturbance, and psychological conditions (See Table 13). Hwa-byung

was positively correlated with symptoms of sleep disturbance ($r = 0.5$, $p < 0.01$), panic

disorder ($r = 0.43$, $p < 0.01$), social anxiety disorder ($r = 0.53$, $p < 0.01$), obsessive-

compulsive disorder ($r = 0.24$, $p < 0.01$), and major depressive disorder ($r = 0.55$, $p <$

$0.01$). In addition, we applied the Pearson's correlation to evaluate the relationship

between hwa-byung and personality traits (See Table 14). Hwa-byung was positively

correlated with Neuroticism ($r = 0.57$, $p < 0.01$) and negatively correlated with

Extraversion ($r = -0.18$, $p < 0.05$).

**Table 13**

*Correlation Between Hwa-Byung, Sleep Disturbance, Psychological Conditions in the Korean Sample*

| Items | Mean | SD | HB | Sleep | PD | SAD | OCD | MDD |
|---|---|---|---|---|---|---|---|---|
| HB | 49.25 | 30.52 | – | | | | | |
| Sleep | 21.51 | 6.07 | .503** | – | | | | |
| PD | 0.53 | 1.40 | .430** | .304** | – | | | |
| SAD | 1.64 | 2.40 | .533** | .303** | .508** | – | | |
| OCD | 0.56 | 0.99 | .238** | .097 | .320** | .259** | – | |
| MDD | 2.15 | 3.37 | .554** | .455** | .541** | .538** | .426** | – |

*Note. N* = 149. SD = Standard Deviation. ** group difference significant at $p < 0.01$. HB = Hwa-byung symptoms, Sleep = Sleep Disturbance, PD = Panic Disorder, SAD = Social Anxiety Disorder, OCD = Obsessive-Compulsive Disorder, MDD = Major Depressive Disorder.

**Table 14**

*Correlation Between Hwa-Byung and the Big Five Personality Traits in the Korean Sample*

| Items | Mean | SD | HB | IPIP | O | C | E | A | N |
|---|---|---|---|---|---|---|---|---|---|
| HB | 49.25 | 30.52 | – | | | | | | |
| IPIP | 44.00 | 7.91 | 0.04 | – | | | | | |
| O | 8.03 | 2.71 | -0.13 | 0.62** | – | | | | |
| C | 9.95 | 2.999 | -0.11 | 0.53** | 0.14 | – | | | |
| E | 8.69 | 2.93 | -0.18* | 0.66** | 0.33** | 0.16 | – | | |
| A | 9.44 | 2.63 | 0.03 | 0.72** | 0.28** | 0.26** | 0.43** | – | |
| N | 7.88 | 2.61 | 0.57** | 0.31** | 0.03 | -0.12 | -0.08 | 0.11 | – |

*Note. N* = 149. *SD* = Standard Deviation. *group difference significant at $p < 0.05$, ** group difference significant at $p < 0.01$. HB = Hwa-byung symptoms. IPIP = Mini International Personality Item Pool (Total of all 20 items). O = Openness; C = Conscientiousness; E = Extraversion; A = Agreeableness; N = Neuroticism.

**American Participants.** Pearson correlations evaluated the relationship between

hwa-byung, sleep disturbance, and psychological conditions (See Table 15). Similar to

the Korean sample, hwa-byung was positively correlated with symptoms of sleep

disturbance ($r = 0.54$, $p < 0.01$), panic disorder ($r = 0.6$, $p < 0.01$), social anxiety disorder

($r = 0.62$, $p < 0.01$), obsessive-compulsive disorder ($r = 0.5$, $p < 0.01$), and major

depressive disorder ($r = 0.79$, $p < 0.01$). Pearson correlations were used to evaluate the

relationship between hwa-byung and personality traits (See Table 16). Hwa-byung was

negatively correlated with total IPIP personality ($r = -0.16$, $p < 0.05$), Conscientiousness

($r = -0.39$, $p < 0.01$), Extraversion ($r = -0.26$, $p < 0.05$), and Neuroticism ($r = -0.52$, $p <$

$0.01$).

**Table 15**

*Correlation Between Hwa-Byung, Sleep Disturbance, Psychological Conditions in the American Sample*

| Items | Mean | SD | HB | Sleep | PD | SAD | OCD | MDD |
|---|---|---|---|---|---|---|---|---|
| HB | 55.81 | 30.34 | – | | | | | |
| Sleep | 21.06 | 6.64 | 0.55** | – | | | | |
| PD | 2.36 | 2.56 | 0.60** | 0.32** | – | | | |
| SAD | 5.05 | 2.71 | 0.62** | 0.45** | 0.33** | – | | |
| OCD | 2.05 | 2.20 | 0.50** | 0.26** | 0.42** | 0.40** | – | |
| MDD | 6.20 | 5.31 | 0.79** | 0.49** | 0.60** | 0.52** | 0.41** | – |

*Note. N* $= 173$. *SD* = Standard Deviation. ** group difference significant at $p < 0.01$. HB = Hwa-byung symptoms, Sleep = Sleep Disturbance, PD = Panic Disorder, SAD = Social Anxiety Disorder, OCD = Obsessive-Compulsive Disorder, MDD = Major Depressive Disorder.

**Table 16**

*Correlation Between Hwa-Byung and the Big Five Personality Traits in the American Sample*

| Items | Mean | SD | HB | IPIP | O | C | E | A | N |
|---|---|---|---|---|---|---|---|---|---|
| HB | 55.81 | 30.34 | – | | | | | | |
| IPIP | 46.76 | 7.76 | -0.16* | – | | | | | |
| O | 10.69 | 2.63 | -0.11 | 0.54** | – | | | | |
| C | 9.56 | 2.71 | -0.39* | 0.56** | 0.12 | – | | | |
| E | 7.27 | 3.64 | -0.26* | 0.66** | 0.10 | 0.27** | – | | |
| A | 11.01 | 2.56 | -0.04 | 0.69** | 0.23** | 0.29** | 0.27** | – | |
| N | 8.23 | 2.30 | 0.52** | 0.29** | 0.095 | -0.17* | -0.08 | 0.17* | – |

*Note. N* = 173. SD = Standard Deviation. *group difference significant at *p* < 0.05, ** group difference significant at *p* < 0.01. HB = Hwa-byung symptoms (N = 149), IPIP = Mini International Personality Item Pool, total of all 20 items. O = Openness; C = Conscientiousness; E = Extraversion; A = Agreeableness; N = Neuroticism.

### *Factor Analyses*

The current study conducted a principal component analysis to evaluate the underlying structure. The Promax kappa rotation was applied to extract three factors. Concerning the *Korean sample*, Factor 1 loaded with items related to emotions of anger, guilt, regret, anxiety, irritability, uselessness, depression, embarrassment, easily startled, trouble sleeping, frequent sighing, intolerance in a hot bath (or hot room temperature), feeling in pain, feeling of something arising (tightening) the chest, concealing feelings, desiring to express feelings to others, inability to concentrate, assuming disease occurs (hypochondriasis), repeating the same actions infinitely (when anxiety occurs). Factor 2 loaded with items about headaches, dizziness, tiredness, hot flashes, stomach problems, heart pounding, and feelings of thirst (as a metaphorical explanation). Lastly, Factor 3 was loaded with items about a desire to escape it all and feelings of enraging, persecution, submission (or obedience).

Concerning the *American sample*, Factor 1 loaded with feelings of guilt, regret, anxiety, depression, irritability, tiredness, embarrassment, uselessness, easily startled, submission (or obedience), frequent sighing, concealing feelings, inability to concentrate, desire to escape it all, desire expressing feelings to others, and repeating the same actions infinitely (when anxiety occurs). Factor 2 loaded with dizziness, hot flashes, stomach problems, trouble sleeping, heart pounding, feeling in pain, intolerance in a hot bath (or hot room temperature), feeling of thirst (as a metaphoric explanation), and something

arising (tightening) in the chest. Lastly, Factor 3 was loaded with emotions of anger, enrage, persecution, and assuming disease occurs (hypochondriasis).

These results showed that both samples indicated feelings in pain, feelings of anxiety, depression, irritability, in pain, frequent sighing, concealing feelings, and repeating the same actions (when anxiety occurs) were considered Factor 1 with a core theme of negative emotion. Dizziness, tiredness, hot flashes, stomach problems, heart pounding, and feelings of thirst (as a metaphoric explanation) were considered Factor 2 consisting of many somatic symptoms. Feelings of anger and persecution comprised Factor 3. These results of the exploratory factor analysis were not completely consistent with the hwa-byung subscales that we developed for the current study, which postulated factors of psychological, cardiovascular, and somatic.

**DISCUSSION**

The current study examined the association between hwa-byung, the Big Five personality dimensions, as well as emotional and behavioral symptoms (i.e., insomnia, anxiety, depression). This study also had some a priori hypotheses in hwa-byung and demographic variables. The first hypothesis claimed that Koreans or Korean Americans would score higher on hwa-byung than Americans. This hypothesis was supported by revealing that Koreans endorsed higher amounts of hwa-byung than Americans, with an effect size difference of approximately 0.29. This finding is fundamental to the notion that hwa-byung is a cultural concept of distress observed primarily in Koreans. The investigators had hoped to obtain a Korean American sub-sample but insufficient numbers of Korean-American participants volunteered for this study.

**Demographics Differences**

The second hypothesis expected specific demographic and psychological differences. Firstly, we expected that the older generation would strongly correlate with hwa-byung more than the younger generation. Our hypothesis was partially supported by revealing that Korean women in the age group 40 to 49 had the highest levels of hwa-byung ($M = 72.2$, $SD = 22.2$). However, in contrast to our expectation, hwa-byung had a low inverse correlation with age ($r = -0.128$). Secondly, we expected married women to have more severe hwa-byung than men. Our hypothesis was partially supported by revealing gender differences and variations in hwa-byung and its associations with the other dependent variables. Korean participants showed significant differences between women and men for all subscales. American participants showed that women had higher hwa-byung than men, as well as higher somatic and cardiovascular symptoms. Although

these findings were mixed, women still had higher hwa-byung and its symptoms than men in both cultures, which is consistent with our hypotheses and prior study (Roberts et al., 2006).

With respect to marital status, hwa-byung and its symptoms were not significantly different in Korean participants. This study had an insufficient sample of married American participants to compare marital status. Contrary to Kim and colleagues (2014), this finding showed that hwa-byung can be seen in individuals who are single, unmarried, or married (Kim et al., 2014). Thirdly, we expected that individuals who either received psychotherapy or took psychiatric medication would have higher levels of hwa-byung. Our hypothesis was supported by revealing that both Koreans and Americans who either received psychotherapy or took psychiatric medication had higher levels of hwa-byung and its symptoms than those who did not. This finding is consistent with extensive literature showing that clinical groups who previously been treated score higher on measures of emotional distress than those who report not having received prior treatment (Davidson, 2014).

**Psychological Symptoms Measures**

The third hypothesis was that hwa-byung, sleep disturbance, and psychological conditions would all be positively associated. Our hypothesis was supported in both cultures, with correlations ranging from .24 to .80 ($p < .01$). These findings support the weak-to-strong relationship reported across all conditions. In addition, these findings may suggest that comorbidities with hwa-byung include sleep disturbance, panic disorder, social anxiety disorder, obsessive-compulsive disorder, and major depressive disorder. These positive correlations between hwa-byung and anxiety, personality, depression,

sleep disturbance are not unexpected, given that the symptoms of hwa-byung are similar to those of internalizing disorders (APA, 2013).

**The Big Five Personality Traits**

The fourth hypothesis was that hwa-byung would show distinctive correlation patterns with the Big Five personality traits. Firstly, we expected that hwa-byung would strongly correlate with neuroticism and agreeableness and negatively correlate with openness and extraversion. Secondly, we also expected that hwa-byung would not correlate with conscientiousness at all. These findings revealed a positive correlation between hwa-byung and neuroticism in both cultures. In Korean participants, there was a negative correlation between hwa-byung and extraversion. American participants showed a negative correlation between hwa-byung, extraversion, and conscientiousness. These findings provide a clear rationale given that hwa-byung shows negative affect and distress aspects, which would be expected to correlate positively with measures of neuroticism. The absence of components related to positive affect would lead to the expectation of a negative correlation between hwa-byung and extraversion. Based on our knowledge, this is the first study to examine the association between the Big Five personality traits, hwa-byung, and hwa-byung symptoms.

**Clinical Research Concerns and Future Directions**

Contrary to American Psychology and Psychiatry, hwa-byung is more widely recognized in Korean Traditional Medicine or Psychiatry. In addition, acupuncture is a frontline therapy for hwa-byung in Korea. Min (2008) indicated that hwa-byung can also be treated with psychotherapy or psychiatric medication (i.e., anti-depressants or anxiolytics). Korean physicians should support American clinicians in gaining a deeper

awareness of hwa-byung. American clinicians should have the knowledge and expertise to be familiar with treating hwa-byung, especially Korean Americans. Future studies are required to explore hwa-byung in Korean American patients and the effectiveness of acupuncture and psychiatric treatments.

Several studies found that hwa-byung can co-occur with pathologies, but limited studies have provided prevalence rates or a deeper analysis of the pattern of correlations. Cheon and Cesario (2022) indicated that hwa-byung can co-occur with depression, anxiety, or other psychological disorders. A prior study described the frequency of 78% of hwa-byung may have "concurrent mental disorders, including [25% to 64% of] depression, [4% to 27% of], generalized anxiety, and [6% of] somatization" (Cheon & Cesario, 2022, p. 196). In addition, the current study found that hwa-byung is associated with high neuroticism. Clinicians who work with hwa-byung need to be aware of the full array of comorbidities that can co-occur with it, including depression, anxiety, and somatic symptom disorder. Given that hwa-byung often increases with age, the diagnostic approach should involve a complete physical exam to examine medical status (i.e., menopausal status), particularly in middle-aged women.

Moreover, previous studies have been conducted on how older generations may have hwa-byung due to external circumstances. However, prior researchers did not examine hwa-byung in younger generations. Hwa-byung should not be limited to a traditional phrase or expression that older generations use to perceive and comprehend hwa-byung symptoms, but also younger generations should recognize it. In addition, future studies should focus more on each gender instead of focusing solely on middle-aged women. Focusing only on this group can cause problems because individuals who

do not understand hwa-byung may connote it as "women or older generations" who may have distress. Therefore, future studies should also investigate and demonstrate that hwa-byung is not limited to women.

Furthermore, culturally competent health and mental health practitioners should be aware that many Koreans may not seek psychotherapy to address their psychological concerns. It is essential to understand that Koreans may perceive individuals with mental disorders as emotionally fragile or lacking in willpower. It is also essential to recognize that Koreans may endure or suppress emotions. Therefore, we recommend that future studies should address these concerns. In general, Koreans may struggle with self-disclosure, specifically expressing emotions and mental health concerns. This may be more centered on treating medical or physical conditions rather than psychological conditions. Korean traditional medicine patients who have hwa-byung may not receive psychotherapy or take any psychiatric medications. Instead, Korean patients may consult Korean medicine physicians to treat hwa-byung because it has several physical and somatic symptoms (Park et al., 2001).

Subsequently, Korean medical doctors may often be cognizant and informed about hwa-byung symptoms, which might suggest *hanyak* (한약, Korean Traditional Medication) or acupuncture (Park et al., 2001). Overall, it should be noted that Koreans and Americans who scored high on measures of hwa-byung might be endorsing symptoms for different reasons. Koreans might have "true" hwa-byung while Americans might be experiencing primarily depression and anxiety, or other symptoms that might be considered "internalizing."

**Limitations**

There were limitations in this study. One limitation was the reliability of the hwa-byung scale. There were a few questions that may not adequately capture the nature of hwa-byung symptoms. These symptoms include humiliation, inability to concentrate, and inability to handle hot baths or temperature changes. Items were selected and assigned to each subscale and hwa-byung symptoms were assigned to one of three categories. This rational-theoretic method was based on the educated judgment of the principal investigator. No inter-rater reliability data were obtained. However, despite what is arguably too subjective, the internal consistencies of the overall hwa-byung scale and hwa-byung subscales were quite good.

The second limitation was the method of personality assessment. Specifically, the Mini-IPIP scale originated in dispositional trait models in North American personality psychology. This may restrict the generalizability of a mono-cultural perspective rooted in American Personality. Although there are several prominent personality models, there are questions regarding the current study and its reliance on the Big Five model of personality. The question is whether the Big Five personality assessment (rooted in an American tradition) is the most effective external validator for representing personality in a Korean sample. Another question is whether distinct personality models provide a more culturally valid set of external validators. A distinct personality model may provide personality dimensions that are more relevant and influential in Korea, leading to theoretically predicated associations with hwa-byung. The HEXACO personality model may be more pertinent and accurate for Koreans rather than the Big Five personality models (Ashton et al., 2006). This personality model may be suitable for Koreans because

it includes honesty-humility facets. In addition, Seo and Hwang (2006) explained that personality disorder studies may be limited in Korea and should be a focus of future research.

The third limitation was the use of self-report measurement. Koreans may tend to avoid responses using the extreme end-of-item scales because excessive levels of responding might imply the presence of psychological concerns. More generally, individuals in Korea may often refrain from disclosing their mental health concerns due to embarrassment and shame. The fourth limitation was the translation process. There were some specific phrases that were quite difficult to accurately translate and then back-translate. For example, one item indicated, "My sleep was restless." When we tried to translate and back-translate accurately, it translated, "I could not sleep well" in Korean. Another example is the distinction in grammatical usage. Korean grammar is structured as subject-object-verb, whereas English is ordered as subject-verb-object. Therefore, slight language difference which were a consequence of distinctive back-translation methods may have led to unreliability of measurement, and variations in the intended meaning of some questions. Several prior studies showed that fluent multilingual specialists often translate and back-translate questionnaires and assessments. In addition, Brislin (1970) explained that linguists may have shared standards for translating precise non-equivalent languages or expressions.

Lastly, the fifth limitation was that only Koreans and Americans participated in this study. The current study aimed to specify facets significantly associated with hwa-byung among Koreans, Korean Americans, and Americans. Lin and colleagues (1992) explained that hwa-byung may be more prevalent among Koreans in the United States

than in Korea (Lin et al., 1992). It may be due to issues related to the language barrier, racism, social isolation, or injustice in society, especially in the legal system. The principal investigator also attempted to recruit Koreans or Korean Americans in the United States. However, it was unsuccessful in obtaining individuals due to time constraints.

The current study has several implications that may be modified for future studies. Future studies may consider using the hwa-byung scale that Korean Medicine or MMPI develops as the hwa-byung scale. The principal investigator intends to develop an assessment in both languages that measures hwa-byung. This will allow Americans to comprehend each item's purpose (or meaning). Instead of using the Big Five personality models, future studies may consider applying the HEXACO personality model. Future studies may examine Korean immigrants to see the relationship between Koreans, Korean Americans, and Americans. Future studies may examine Korean Americans and ask whether they are first generations, 1.5 generations, or second generations. Future studies can also see which items vary by demographic status (e.g., ages, marital status, etc.). For example, suppressed anger items may have a higher prevalence in older generations (e.g., 60 and higher), and anxiety items may be more prevalence in younger generations (e.g., in their twenties). Given the mixed findings, future studies should also explore the connection between hwa-byung and marital status.

**CONCLUSION**

These findings were consistent with what is commonly known about hwa-byung, specifically among Korean samples. Consistent with our hypotheses, the findings were reported as high levels of hwa-byung in the Korean sample, middle-aged Koreans, and both Korean and American women. As expected, hwa-byung was positively correlated with neuroticism and negatively correlated with extraversion in both Korean and American samples. However, the Big Five may not be the most reliable method to convey personality traits in a Korean sample. Despite recruitment efforts, we were unable to recruit sufficient numbers of Korean Americans to conduct practical analyses. Therefore, future studies should be conducted on Korean Americans to see whether Korean and Korean Americans endorse hwa-byung symptoms similarly or differently.

In addition, we collected data on previous treatment utilization, but future studies should examine the effectiveness of treatments for hwa-byung that are currently (acupuncture or herbal medicine) used as frontline therapies of hwa-byung in Korea. Future studies should also examine the construct of hwa-byung (particularly in Korean Americans) and potentially involve psychologists in developing evidence-based psychotherapy for hwa-byung. Furthermore, it may be conceivable that Americans who endorsed hwa-byung may be influenced by various reasons, such as individuals experiencing depressive symptoms rather than hwa-byung. Future researchers may ask single individuals questions concerning social discrimination, conflicts, and psychosocial stressors in both countries. Perhaps status as marginalized individuals (e.g., racial and ethnic groups) are more vulnerable to symptoms resembling hwa-byung, and thus symptoms resembling hwa-byung might be detectable in some Americans as well.

**APPENDICES**

**Appendix A: Geographical Differences**

**Figure 1**

*Differences Between Cultures*
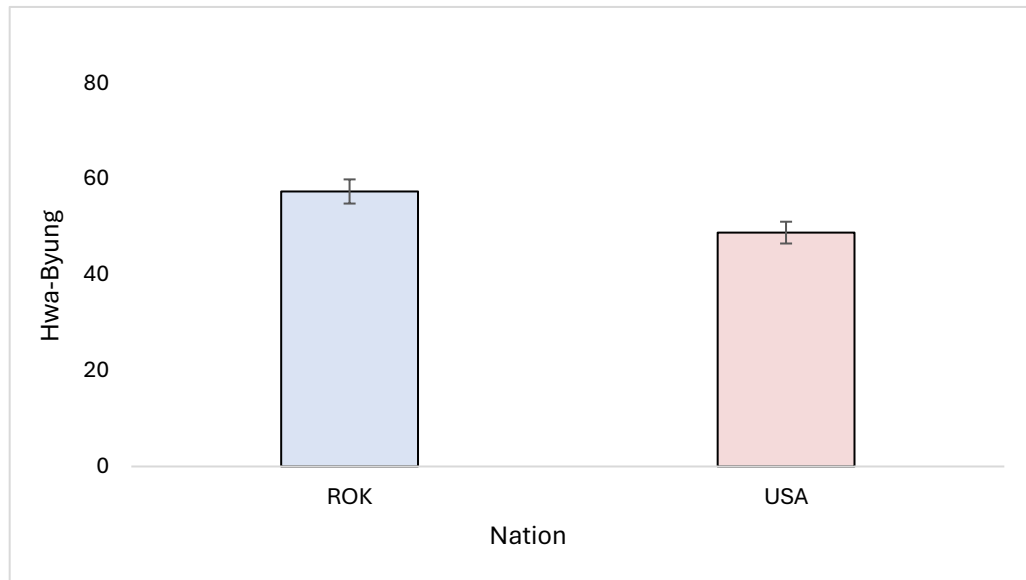


*Note.* $N$ = 322. ROK = Republic of Korea. USA = United States of America. This graph is labeled with the x-axis as distinct countries and the y-axis as mean differences scores for hwa-byung. This graph also shows error bars to indicate the estimate. Overall, this shows that individuals who live in the Republic of Korea experience hwa-byung more than individuals who live in the United States of America.

**Appendix B: Age Differences**

**Figure 2**

*Differences Between Age Groups*
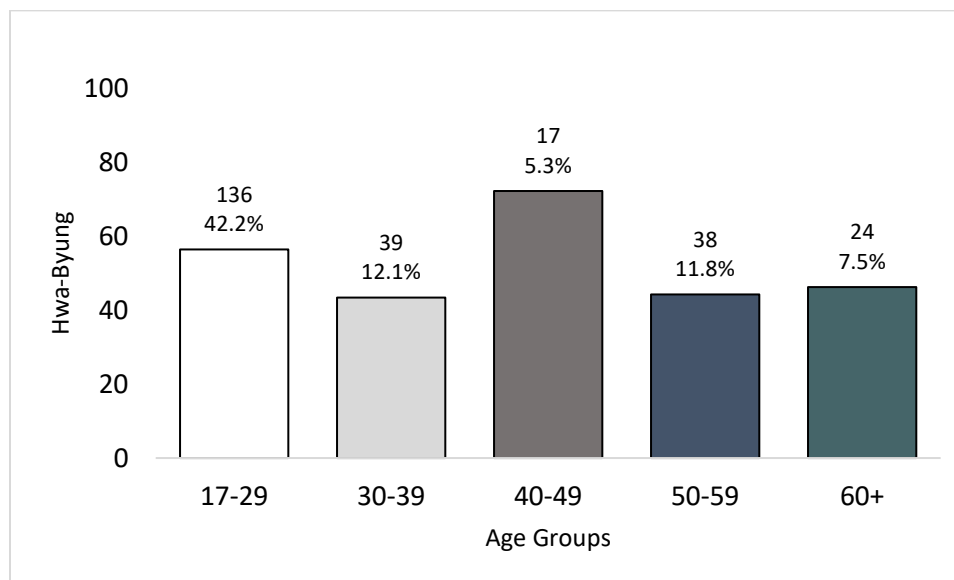


Note. *N* = 254. Two hundred and fifty-four participants reported their age and 68 participants did not report their age or provided an invalid response. Only American participants did not report their age or provided an invalid response. This graph is labeled with the x-axis as an age group and the y-axis as mean differences scores for hwa-byung. This graph also labeled frequencies and descriptive statistics of all ages. Overall, this shows that middle-aged individuals experience hwa-byung more than any other age groups.

## Appendix C: Hwa-Byung Scale

Please check on each item to describe your experience during the last month.

| 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|
| Always | Frequently | Often | Sometimes | Rarely | Never |

|  |
|---|
| Items |

1.  I felt angry.
2.  I felt enraged.
3.  I felt persecuted.
4.  I want to get away from it all.
5.  I wanted to express my feelings to somebody.
6.  I felt depressed.
7.  I worried and was tense.
8.  I felt anxious and repeated the same action again and again.
9.  I believed that I have a disease.
10. I felt regret.
11. I felt embarrassed.
12. I felt guilty.
13. I felt useless.
14. I have been submissive or obedient.
15. I have been easily startled.
16. I have been unable to concentrate.
17. I have been irritable.
18. I have been in pain.
19. I have hidden my feelings.
20. I have had hot flashes.
21. I often sighed.
22. I have felt something was pushing up (tightening) in my chest.
23. I have had trouble sleeping.
24. I have had headaches.
25. My heart has pounded.
26. I have felt dizzy.
27. I have been tired.
28. I have been very thirsty.
29. I have had less or no interest in sex.
30. I have had stomach problems.
31. I have been unable to tolerate a hot bath or hot room temperature.

# 화병 측정 (수정본)
## Hwa-Byung Scale (Revised)

최근 몇주 또는 몇달 동안 자신에 대해 어떻게 느끼고 있는지 해당하는 부분에 체크해 주세요.

Please check on each item to describe your experience during the last month.

| 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|
| 매우 동의함 | 약간 동의함 | 보통 | 동의 안함 | 약간 동의 안함 | 전혀 동의 안함 |
| Strongly Agree | Somewhat Agree | Neutral | Disagree | Somewhat Disagree | Strongly Disagree |

| 문항 |
|---|

1. 내 마음속에 화가 많이 있다.
2. 나는 비참하게 살아왔다.
3. 나는 박해를 받아 왔다.
4. 나는 어디론가 도망가고 싶었다.
5. 나는 내 감정을 누군가에게 털어놓고 싶다.
6. 나는 우울하다.
7. 나는 불안하다.
8. 나는 근심이 많아 했던 일을 반복한다.
9. 나는 질병이 있다고 생각한다.
10. 나는 후회를 한다.
11. 나는 당황해 한다.
12. 나는 죄책감이 든다.
13. 나는 내 자신이 가치가 없다고 생각한다.
14. 나는 복종 또는 순종하며 살아왔다.
15. 나는 깜짝 깜짝 놀란다.
16. 나는 집중 할 수가 없다.
17. 나는 초조하다.
18. 나는 고통을 느낄때가 있다.
19. 나는 내 감정을 숨기면서 살아왔다.
20. 나는 얼굴에 열이 자주 달아오른다.
21. 나는 한숨을 잘 쉰다.
22. 내 가슴에서 무언가가 치밀어 오르는것을 느낀다.
23. 잠에 드는 것이 힘들다.
24. 두통이 있다.
25. 가슴이 두근거린다.
26. 어지럽다.
27. 피곤함을 느낀다.
28. 갈증이 난다.
29. 성관계에 대한 흥미가 없다.
30. 소화가 잘 안되고 체하는 편이다.
31. 뜨거운 목욕탕 또는 뜨거운 것을 견디기가 어렵다.

## Appendix D: Mini International Personality Item Pool (IPIP)

Please rate how much each statement describes yourself.

| 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|
| Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly Disagree |

| Items |
|---|

1. I am the life of the party.

2. I sympathize with others' feelings.

3. I get chores done right away.

4. I have frequent mood swings.

5. I have a vivid imagination.

6. I don't talk a lot.

7. I am not interested in other people's problems.

8. I often forget to put things back in their proper place.

9. I am relaxed most of time.

10. I am not interested in abstract ideas.

11. I talk to a lot of different people at parties.

12. I feel others' emotions.

13. I like order.

14. I get upset easily.

15. I have difficulty understand abstract ideas.

16. I keep in the background.

17. I am not really interested in others.

18. I make a mess of things.

19. I seldom feel blue.

20. I do not have a good imagination.

# 성격 유형 검사
## Personality Traits Assessment (Mini-IPIP)

다음 아래의 각 문항에 설명된 내용을 평가해 주시고 해당하는 척도에 체크해 주세요.
Please rate how much each of the following statements describes you using the scale provided.

| 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|
| 매우 동의함 | 동의함 | 동의 또는 반대 하지도 않음 | 동의하지 않음 | 매우 동의하지 않음 |
| Strongly Agree | Agree | Neither Agree nor Disagree | Disagree | Strongly Disagree |

| 문항 |
|---|

1. 나는 각종 모임에 다니는 것을 즐긴다.

2. 나는 다른 사람들의 감정을 잘 공감한다.

3. 나는 자질구레한 일들은 금방금방 해치운다.

4. 나는 감정의 기본이 심하다.

5. 나는 생생한 상상력을 가지고 있다.

6. 나는 말이 적은 편이다.

7. 나는 다른 사람들의 개인적인 문제에 관심이 없다.

8. 나는 물건들을 제자리에 되놓은 것을 자주 잊는다.

9. 나는 대체적으로 이완된 상태이다.

10. 나는 복잡한 것은 질색이다.

11. 나는 모임에서 여러 사람들과 이야기를 나누는 편이다.

12. 나는 주변 다른 사람들의 감정을 잘 알아차린다.

13. 나는 질서정연한 것을 좋아한다.

14. 나는 쉽게 속이 상한다.

15. 나는 추상적인 것을 잘 이해하지 못한다.

16. 나는 나서지 않는 편이다.

17. 나는 다른 사람들에 대해 별로 관심이 없다.

18. 나는 물건들을 어질러 놓는 편이다.

19. 나는 거의 우울함을 느끼지 않는 편이다.

20. 나는 상상력이 좋지 않다.

## Appendix E: Sleep Disturbance

Please check the following questions about sleep habits and sleep quality during the past 7 days.

1. My sleep was restless.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not at all | A little bit | Somewhat | Quite a bit | Very much |

2. I was satisfied with my sleep.

| 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|
| Not at all | A little bit | Somewhat | Quite a bit | Very much |

3. My sleep was refreshing.

| 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|
| Not at all | A little bit | Somewhat | Quite a bit | Very much |

4. I had difficulty falling asleep.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not at all | A little bit | Somewhat | Quite a bit | Very much |

5. I had trouble staying asleep.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Never | Rarely | Sometimes | Often | Always |

6. I had trouble sleeping.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Never | Rarely | Sometimes | Often | Always |

7. I got enough sleep.

| 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|
| Never | Rarely | Sometimes | Often | Always |

8. My sleep quality was….

| 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|
| Very poor | Poor | Fair | Good | Very Good |

# 수면장애
## Sleep Disturbance

<u>지난 7 일 동안</u> 수면 습관과 수면의 질에 대하여 다음 해당하는 척도에 체크해 주세요.
Please check the following questions about sleep habits and sleep quality during the past 7 days.

### 1. 수면이 불규칙 했다.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 전혀 그렇지 않다 | 조금 그렇다 | 다소 그렇다 | 상당히 그렇다 | 매우 그렇다 |
| Not at all | A little bit | Somewhat | Quite a bit | Very much |

### 2. 수면이 만족스러웠다.

| 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|
| 전혀 그렇지 않다 | 조금 그렇다 | 다소 그렇다 | 상당히 그렇다 | 매우 그렇다 |
| Not at all | A little bit | Somewhat | Quite a bit | Very much |

### 3. 수면 후 개운했다.

| 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|
| 전혀 그렇지 않다 | 조금 그렇다 | 다소 그렇다 | 상당히 그렇다 | 매우 그렇다 |
| Not at all | A little bit | Somewhat | Quite a bit | Very much |

### 4. 잠 드는 것이 어려웠다.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 전혀 그렇지 않다 | 조금 그렇다 | 다소 그렇다 | 상당히 그렇다 | 매우 그렇다 |
| Not at all | A little bit | Somewhat | Quite a bit | Very much |

### 5. 수면 상태를 유지 하는 것이 어려웠다.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 전혀 그렇지 않다 | 거의 그렇지 않다 | 가끔 그렇다 | 자주 그렇다 | 항상 그렇다 |
| Never | Rarely | Sometimes | Often | Always |

### 6. 잠을 자기 힘들다.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 전혀 그렇지 않다 | 거의 그렇지 않다 | 가끔 그렇다 | 자주 그렇다 | 항상 그렇다 |
| Never | Rarely | Sometimes | Often | Always |

### 7. 충분히 수면을 취했다.

| 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|
| 전혀 그렇지 않다 | 거의 그렇지 않다 | 가끔 그렇다 | 자주 그렇다 | 항상 그렇다 |
| Never | Rarely | Sometimes | Often | Always |

### 8. 나의 수면의 질은….

| 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|
| 매우 좋지 않다 | 좋지 않다 | 그저 그렇다 | 좋다 | 매우 좋다 |
| Very poor | Poor | Fair | Good | Very Good |

# Appendix F: PDSQ Panic Disorder

Please select Yes if this describes you in the past 2 weeks, including today.

1. Did you get very scared because your heart was beating fast?

   o Yes
   o No

2. Did you get very scared because you were short of breath?

   o Yes
   o No

3. Did you get very scared because you were feeling shaky or faint?

   o Yes
   o No

4. Did you get sudden attacks of intense anxiety or fear that came on from out of the blue, for no reason at all?

   o Yes
   o No

5. Did you get sudden attacks of intense anxiety or fear during which you thought something terrible might happen, such as your dying, going crazy, or losing control?

   o Yes
   o No

6. Did you have sudden, unexpected attacks of anxiety during which you had three or more of the following symptoms: heart racing or pounding, sweating, shakiness, shortness of breath, nausea, dizziness, or feeling faint?

   o Yes
   o No

7. Did you worry a lot about having unexpected anxiety attacks?

   o Yes
   o No

8. Did you have anxiety attacks that caused you to avoid certain situations or to change your behavior or normal routine?

   o Yes
   o No

## 공황장애
### Panic Disorder

오늘을 포함하여 지난 2주 동안 귀하의 행동이나, 느낌 또는 생각과
같으면 '네'를 아니라면 '아니요'를 체크해 주세요.

Please check 'Yes' if this describes your actions, feelings, or thinking
in the past two weeks, including today, and 'No' if it does not.

1. 심장이 빨리 뛰어서 많이 무서웠습니까?
   - o 네
   - o 아니요

2. 숨이 차서 많이 무서웠습니까?
   - o 네
   - o 아니요

3. 몸이 떨리거나 기절해서 무서웠습니까?
   - o 네
   - o 아니요

4. 아무 이유 없이 급작스럽게 갑자기 극심한 불안이나 두려움이 발생했습니까?
   - o 네
   - o 아니요

5. 급작스러운 극심한 불안이나 두려움이 발생해 당신이 죽거나, 미치거나, 자제력
   잃은 것 같은 끔찍한 일이 일어 날 수도 있다고 생각했습니까?
   - o 네
   - o 아니요

6. 다음중 세가지 이상 증상이 나타나 급작스럽고 예기치 못했던 불안 발작이
   발생했습니까? 심장이 뛰거나 두근거림, 발한, 떨림, 숨가쁨, 메스꺼움, 현기증
   또는 실신.
   - o 네
   - o 아니요

7. 예상치 못한 불안 발작에 대해 걱정을 많이 했습니까?
   - o 네
   - o 아니요

8. 특정 상황을 피하거나 일상적인 일과를 바꾸게 만든 불안 발작이 있었습니까?
   - o 네
   - o 아니요

### Appendix G: PDSQ Obsessive-Compulsive Disorder (OCD)

Please select Yes if this describes you in the past 2 weeks, including today.

1. Did you worry obsessively about dirt, germs, or chemicals?

   o Yes
   o No

2. Did you worry obsessively that something bad would happen because you forgot to do something important like locking the door, turning off the stove, or pulling out the electrical cords of appliances?

   o Yes
   o No

3. Were there things you felt compelled to do over and over (for at least ½ hour per day that you could not stop doing when you tried?

   o Yes
   o No

4. Were there things you felt compelled to do over and over even though they inferred with getting other things done?

   o Yes
   o No

5. Did you wash and clean yourself or things around you obsessively and excessively?

   o Yes
   o No

6. Did you obsessively and excessively check things or repeat actions over and over again?

   o Yes
   o No

7. Did you count things obsessively and excessively?

   o Yes
   o No

## 강박장애
## Obsessive-Compulsive Disorder (OCD)

오늘을 포함하여 지난 2 주 동안 귀하의 행동이나, 느낌 또는 생각과
같으면 '네'를 아니라면 '아니요'를 체크해 주세요.

Please check 'Yes' if this describes your actions, feelings, or thinking
in the past two weeks, including today, and 'No' if it does not.

1. 먼지, 세균, 화학 물질에 대하여 강박적으로 걱정을 했습니까?

   o 네
   o 아니요

2. 문을 잠그거나 난로를 끄거나 가전제품의 코드를 뽑는 것과 같은 중요한 일을 잊어버려
   나쁜 일이 날 것이라고 강박적으로 걱정했습니까?

   o 네
   o 아니요

3. 하루에 적어도 30 분 이상, 일을 반복했고 계속 해서 그 일을 해야 한다고 느꼈습니까?

   o 네
   o 아니요

4. 다른 일을 하는데 방해는 되지만 계속 해서 해야 한다고 느꼈습니까?

   o 네
   o 아니요

5. 자신이나 주변의 물건을 강박적으로 과도하게 깨끗이 씻었습니까?

   o 네
   o 아니요

6. 강박적으로 과도하게 확인하거나 행동을 반복했습니까?

   o 네
   o 아니요

7. 강박적으로 과도하게 물건을 세었습니까?

   o 네
   o 아니요

## Appendix H: PDSQ Social Phobia

Please select Yes if this describes you in the past 6 months, including today.

| Items | Yes | No |
|---|---|---|
| 1. Did you worry a lot about embarrassing yourself in front of others? | Yes | No |
| 2. Did you worry a lot that you might do something to make people think that you were stupid or foolish? | Yes | No |
| 3. Did you feel very nervous in situations where people might pay attention to you? | Yes | No |
| 4. Were you extremely nervous in social situations? | Yes | No |
| 5. Did you regularly avoid any situations because you were afraid you'd do or say something to embarrass yourself? | Yes | No |
| 6. Did you worry about a lot about doing or saying to embarrass yourself in any of the following situations? <br><br> a. Public speaking <br> b. Eating in front of other people <br> c. Using public restrooms <br> d. Writing in front of others <br> e. Saying something stupid when you were with a group of people <br> f. Asking a question when in a group of people <br> g. Business meetings <br> h. Parties or other social gatherings | Yes | No |
| 7. Did you almost always get very anxious as soon as you were in any of the above situations? | Yes | No |
| 8. Did you avoid any of the above situations because they made you feel anxious or fearful? | Yes | No |

**사회공포증 (사회불안장애)**
**Social Phobia (Social Anxiety Disorder)**

<u>오늘을 포함하여 지난 6 개월 동안</u> 귀하의 행동이나, 느낌 또는 생각과
같으면 '<u>네</u>'를 아니라면 '<u>아니요</u>'를 체크해 주세요.

Please check 'Yes' if this describes your actions, feelings, or thinking
in the past 6 months, including today, and 'No' if it does not.

| 문항 | 네 | 아니요 |
|---|---|---|
| 1. 다른 사람들 앞에서 창피 당할까봐 많이 걱정했습니까? | 네 | 아니요 |
| 2. 사람들이 당신이 어리석거나 바보 같다고 생각 할 수 있는 행동을 할 까봐 많이 걱정했습니까? | 네 | 아니요 |
| 3. 사람들이 당신에게 주목하는 상황에서 매우 긴장했습니까? | 네 | 아니요 |
| 4. 사회적 상황에서 극도록 긴장했습니까? | 네 | 아니요 |
| 5. 자신을 창피하게 만들 행동이나 말을 할까봐 두려운 상황을 정기적으로 피했습니까? | 네 | 아니요 |
| 6. 다음과 같은 상황에서 자신을 창피하게 하는 행동이나 말에 대해 걱정을 많이 했습니까?<br><br>ㄱ. 공개적 발언<br>ㄴ. 다른 사람 앞에서 식사 할때<br>ㄷ. 공공화장실 사용 할때<br>ㄹ. 다른 사람들 앞에서 글 쓸때<br>ㅁ. 여러 사람 앞에서 어리석은 말을 할때<br>ㅂ. 다른 사람들 앞에서 질문 할때<br>ㅅ. 업무 회의<br>ㅇ. 파티 또는 기타 사회모임 | 네 | 아니요 |
| 7. 위와 같은 상황에 처하면 거의 항상 불안했습니까? | 네 | 아니요 |
| 8. 위와 같은 상황이 불안하거나 두려워서 회피한 일이 있습니까? | 네 | 아니요 |

## Appendix I: PDSQ Major Depressive Disorder (MDD)

Please select Yes if this describes you in the past 2 weeks, including today.

| Yes | No |
|---|---|

| Items |
|---|

1. Did you feel sad or depressed?

2. Did you feel sad or depressed for most of the day, nearly every day?

3. Did you get less joy or pleasure from almost all of the things you normally enjoy?

4. Were you less interested in almost all of the activities you are usually interested in?

5. Was your appetite significantly *smaller* than usual nearly every day?

6. Was your appetite significantly *greater* than usual nearly every day?

7. Did you sleep at least 1 to 2 hours than *less* usual nearly every day?

8. Did you sleep at least 1 to 2 hours than *more* usual nearly every day?

9. Did you feel very jumpy and physically restless, and have a lot of trouble sitting calmly in a chair, nearly every day?

10. Did you feel tired out nearly every day?

11. Did you frequently feel guilty about things you have done?

12. Did you put yourself down and have negative thoughts about yourself nearly every day?

13. Did you feel like a failure nearly every day?

14. Did you have problems concentrating nearly every day?

15. Was decision making more difficult than normal nearly every day?

16. Did you frequently think of dying in passive ways like going to sleep and not waking up?

17. Did you wish you were dead?

18. Did you think you'd be better off dead?

19. Did you have thoughts of suicide, even though you would not really do it?

20. Did you seriously consider taking your life?

21. Did you think about a specific way to take your life?

## 주요우울장애 (우울증)
### Major Depressive Disorder (Depression)

<u>오늘을 포함하여 지난 2주 동안</u> 귀하의 행동이나, 느낌 또는 생각과
같으면 '<u>네</u>'를 아니라면 '<u>아니요</u>'를 체크해 주세요.

Please check 'Yes' if this describes your actions, feelings, or thinking
in the past two weeks, including today, and 'No' if it does not.

| 네 | 아니요 |
|---|---|
| | |

| 문항 |
|---|

1. 슬프거나 우울하다고 느꼈습니까?

2. 거의 매일, 하루 종일 슬프거나 우울하다고 느꼈습니까?

3. 당신이 평상시 즐기던 거의 대부분 일이 더 이상 즐겁거나 기쁘지 않았습니까?

4. 당신이 평소 흥미를 느꼈던 거의 모든 활동에 흥미가 줄었습니까?

5. 거의 매일, 식욕이 평소보다 현저하게 줄었습니까?

6. 거의 매일, 식욕이 평소보다 현저하게 늘었습니까?

7. 거의 매일, 평소보다 적어도 1~2 시간 적게 잤습니까?

8. 거의 매일, 평소보다 적어도 1~2 시간 잠을 많이 잤습니까?

9. 거의 매일, 신경이 아주 예민해지고 신체적으로 안정되지 않아 자리에 차분히 않아 있기가 많이 힘들었습니까?

10. 거의 매일, 녹초가 될 정도로 피곤함을 느꼈습니까?

11. 자신이 한 일에 대해 자주 죄책감을 느꼈습니까?

12. 거의 매일, 자신을 비하하고 자신에 대해 부정적인 생각을 했습니까?

13. 거의 매일, 자신이 실패한 사람 같다고 느꼈습니까?

14. 거의 매일, 무슨 일에 집중하기가 어려웠습니까?

15. 거의 매일, 무슨 결정을 하기가 평소보다 더 힘들었습니까?

16. 잠이 들어 영영 깨어나지 않는 것처럼 소극적인 방식으로 죽는 것에 대해 자주 생각했습니까?

17. 죽기로 바랐습니까?

18. 차리리 죽는게 낫겠다고 생각했습니까?

19. 정말로 자살하려 한 것은 아니더라도, 자살에 대해 생각해 봤습니까?

20. 자살을 진지하게 생각해 봤습니까?

21. 구체적인 자살 방법에 대해 생각해 봤습니까?

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