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Studies on the Role of Self-esteem and Self-compassion in Suicide Prevention

(自殺予防における自尊感情とセルフコンパッションの役割
に関する研究)

2024 年 12 月

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LIST OF PUBLISHED PAPERS AND CONFERENCE PRESENTATIONS

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The effectiveness of self-esteem-related interventions in reducing suicidal behaviors: a systematic review and meta-analysis.
Frontiers in psychiatry, 1219 (2022): 925423. doi: 10.3389/fpsyt.2022.925423
2. Nguyen Tan Dat, Nobuyuki Mitsui, Satoshi Asakura, Yutaka Fujii, Kuniyoshi Toyoshima, Ichiro Kusumi.
Relationship between self-esteem and suicidal ideation before and during COVID-19 in a non-clinical sample: mediating effects of psychological distress and hopelessness.
Frontiers in psychiatry, 14 (2023): 1240715. doi: 10.3389/fpsyt.2023.1240715
3. Nguyen Tan Dat, Nobuyuki Mitsui, Satoshi Asakura, Yutaka Fujii, Kuniyoshi Toyoshima, Ichiro Kusumi.
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2. Nguyen Tan Dat
大学生の自殺念慮に対する自尊感情の影響について：COVID-19 パンデミック発生後の心理的苦痛と絶望感の媒介効果の変化に関する分析

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3. Nguyen Tan Dat
A brief self-compassion and self-esteem intervention for suicidal university students: A feasibility study
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SUMMARY

[Literature Review]

Suicide is a serious social issue, especially in university students. In Japan, the suicide rates of young adults aged 18 to 25 years old witnessed a significant rise since 2018. Furthermore, with the sudden emergence of the COVID-19 pandemic, serious mental health issues are expected to surge, especially after the disruption in education and social life that university students suffered during this period. As a result, it is important to investigate risk factors for suicide as well as necessary intervention for suicide prevention among this sample.

[Chapter I]

Background and Objectives: Suicide is a serious social issue and is often treated using psychological interventions. Although various psychological interventions exist, there is a growing interest in targeting self-esteem as a key component in suicide prevention strategies. The first chapter would conduct a systematic review and meta-analysis aimed to investigate the effectiveness of self-esteem-related interventions on suicidal behaviors.

Methods: A systematic literature search for randomized controlled trials (RCTs) including a self-esteem component was conducted on 29 May 2021 and updated on 4 April 2022 using the database of PubMed, Web of Science, and PsychInfo. Screening and data extraction was performed by the thesis's author and data analysis was conducted using Review Manager.

Results: In total, 12 studies were included in the systematic review and five studies were included in the meta-analysis. Small effect sizes were found for suicidal ideation at post intervention [$g = -0.24$, 95% CI (-0.48, 0.00)] and a 3-month follow-up [$g = -0.36$, 95% CI (-0.62, -0.11)].

Discussion: The current review suggests that future intervention studies should incorporate self-esteem enhancement in the treatment of suicidal behaviors, especially for suicidal ideation. However, these results should be interpreted cautiously due to the limited number of included studies and varied sample population. Additionally, the variability in study populations suggests that interventions may need to be tailored to specific groups to maximize effectiveness.

[Chapter II]

Background and Objectives: Several studies have highlighted the impact of the novel coronavirus disease (COVID-19) pandemic on suicide. Accordingly, investigating the risk factors of suicide during this crisis is crucial for future prevention. Based on the escape theory of suicide, the current chapter examined the serial mediating roles of psychological distress and hopelessness in the relationship between self-esteem and suicidal ideation. It also aimed to explore whether or not the COVID-19 pandemic changed the mediation effect in any way.

Methods: Data were collected from 645 university students before and during the pandemic at the health care center of Hokkaido university. The study employed mediation and multi-group analyses to test the hypotheses using SPSS and AMOS software.

Results: The results demonstrated that individuals with low self-esteem reported high psychological distress, which further lead to hopelessness and eventually heightened suicidal ideation. Furthermore, multi-group analysis revealed that psychological distress exerted a greater impact on suicidal ideation during COVID-19.

Discussion: The finding suggested that self-esteem, hopelessness, and psychological distress could help elucidate the development of suicidal ideation. Clinicians may target these factors in suicide prevention programs, particularly in the settings of the COVID-19 pandemic or future crisis.

[Chapter III]

Background and Objectives: Suicide is a serious mental health problem among university students. The final chapter of the current thesis aimed to examine the effectiveness of a novel psychoeducation program targets suicidal ideation by enhancing self-esteem and self-compassion.

Methods: A single-arm study design was implemented to investigate the feasibility and acceptability of a novel psychoeducation program for university students who experienced suicidal ideation. The novel psychoeducation program is based on the previous literature and focuses on enhancing self-esteem using techniques from cognitive behavioral therapy and self-compassion interventions. The program consists of four weekly one-hour sessions: the first session introduces the concepts of self-esteem and self-compassion; the second session addresses cognitive distortions; the third session focuses on coping with self-criticism; and the final session covers suicide prevention and summarizes the program. Recruitment took place in Hokkaido University health care center and Hokkaido University hospital. Suicidal behaviors, self-compassion, self-esteem, and other psychological variables were measured at baseline, post-intervention, 1-month, 2-month and 3-month follow-up. A subset of participants also completed an evaluation of the program's acceptability.

Results: Seventeen participants consented to take part in the intervention with fourteen participants completed post treatment assessments. The attrition rate for treatment was 28,6%. The paired-sample t-test indicated that self-compassion ($g = 1.02 [0.56; 1.48]$), depression ($g = 0.62 [0.22; 1.03]$), hopelessness ($g = 0.49 [0.18; 0.79]$), and suicide risk ($g = 0.43 [0.06; 0.79]$) significantly changed from baseline to post-intervention. At the four-week follow-up, we observed significant changes between baseline and one-month-follow-up for self-esteem and self-compassion, with a large effect size ($g = 1.04 [0.39; 1.69]$) and a moderate effect size ($g = 0.53 [0.08; 0.98]$) respectively. At the eight-week follow-up, improvements in self-esteem ($g = 0.44 [0.05; 0.82]$) and self-compassion ($g = 1.00 [0.20; 1.80]$) remained significant. Additionally, changes in hopelessness ($g = 0.37 [0.09; 0.66]$) and suicide risk ($g = 0.64 [0.27; 1.01]$) returned to be significant during this period. At the twelve-

week follow-up, the paired-sample t-test demonstrated that only self-compassion ($g = 1.22$ [0.05; 2.38]), suicide risk ($g = 0.68$ [0.03; 1.33]), and depression ($g = 0.96$ [0.44; 1.48]) showed significant changes with moderate to large effect sizes. Four participants also experience clinically significant changes in depression severity. Additionally, the psychoeducation program was positively received by the participants.

Discussion: The study showed high acceptability and feasibility, and promising early outcomes for the psychoeducation program. However, the study suffers from a small sample size in combination with a lack of control group. Further studies to examine the efficacy of the program is highly warranted.

[Conclusion]

The synthesis of findings across these studies highlights the importance of self-image, especially self-esteem and self-compassion in both the development and prevention of suicidal behaviors. Chapters 1 and 2 underscore the critical role of self-esteem in mitigating suicidal ideation, particularly through its influence on psychological distress and hopelessness. Additionally, the small but significant effects observed in the meta-analysis suggest that enhancing self-esteem can be an effective component of suicide prevention strategies.

Based on the results collected from Chapters I and II, the pilot study presented in Chapter III offers preliminary evidence that a self-image-based psychoeducation program is both feasible and acceptable for university students experiencing suicidal ideation. Although the study's limitations, such as a small sample size and a lack of control group, prevent definitive conclusions, the positive outcomes observed warrant further investigation.

In light of these findings, it is recommended that future research focus on conducting larger-scale randomized controlled trials to rigorously assess the efficacy of self-esteem and self-compassion interventions in reducing suicidal behaviors. Additionally, the adaptability of such interventions to different populations and crisis contexts, such as the COVID-19 pandemic, should be explored. Overall, this review contributes to the growing body of evidence supporting the integration of self-image enhancement in suicide prevention programs, particularly for university students.

ABBREVIATION TABLE

List of Abbreviations

BHS	Beck Hopelessness Scale
CBT	Cognitive behavioral therapy
COVID-19	Coronavirus disease 2019
K10	Kessler Psychological Distress Scale
ITPS	Interpersonal Theory of Suicide
MINI	Mini-International Neuropsychiatric Interview
PHQ-9	Patient Health Questionnaire-9
RCI	Reliable Change Index
RCT	Randomized Controlled Trial
RSES	Rosenberg Self-esteem Scale
SCS	Self-compassion Scale
SMD	Standardized mean difference
TCI	Temperament and Character Inventory

LITERATURE REVIEW

1. SUICIDE-A PUBLIC HEALTH CRISIS

Suicide is seen as a global phenomenon. The World Health Organization (WHO) reported that approximately 800,000 suicide deaths occur per year, which means that one person dies by committing suicide every 40 seconds (World Health Organization, 2021). Suicide is considered a serious social issue because it not only affects the deceased person but also leaves a tremendous impact on suicide survivors and the economy. In terms of its social effects, a recent study in United States demonstrated that a single suicide death can affect up to 135 people (Cerel et al., 2019). Additionally, family members and close acquaintances left behind by the suicide victim usually experience social withdrawal, guilt, self-blame, mental disorders and are even at risk of committing suicide (Cerel et al., 2019; Hanschmidt et al., 2016). In terms of the economic consequences, suicide death is suggested to lead to a loss of productivity from those engaging in suicidal behaviors and the family members left behind (Anderson et al., 2005). Furthermore, data from Australia suggested that the annual economic cost of suicide and non-lethal suicidal behaviors is estimated at \$6.73 billion, which is approximately 1 trillion yen (Kinchin and Doran, 2017).

Suicide completion is usually a consequence of suicide attempt. Specifically, for every suicide completion, there is approximately 30 suicide attempts (Schreiber and Culpeppe, 2024). As a result, suicide may prove to be a burden on the healthcare system. In the US, emergency department visits related to suicidal behaviors among people under 25 years old increased from 0.9% in 2011-2012 to 4.2% in 2019-2020 (Santillanes et al., 2020). Thus, more research into intervention programs to prevent future suicide is imperative.

In Japan, suicide is also very common, with suicide death rated as the 9th cause of death for male and 11th for female in 2022. Furthermore, in terms of age distribution, suicide is the leading cause of death for Japanese in the 10-39 age bracket (Ministry of Health, Labour and Welfare, 2023). In comparison with other countries, in 2021, Japan ranked 48th in suicide rates in the world, and ranked 10th in suicide rates among the developed countries (Wisevoter, 2023). From the suicide data collected by National Police Agency (NPA), while Japanese suicide rates witness a downward trend since 2009, suicide rates have been steadily increasing since 2020, correspond with the sudden emergence of COVID-19 (National Police Agency, 2023). Moreover, the latest data from NPA showed that there were 21818 suicide cases in Japan in 2023, meaning that roughly 2 people die by suicide every hour in Japan (National Police Agency, 2024). As a result, more attention is needed for suicide in Japan.

2. SUICIDE AMONG UNIVERSITY STUDENTS

Suicide is also a serious issue on college campuses worldwide and in Japan. A meta-analysis revealed concerning rates of suicidal thoughts and behaviors in university students' population, with

22.3% reporting lifetime ideation, 6.1% forming plans, and 3.2% attempting suicide (Mortier et al., 2018). A review suggests that negative self-perceptions; a sense of meaninglessness in life; academic anxieties and pressures; family problems; hopelessness; depression; and bipolar disorder are the major risk factors for suicide among this sample (Gselamu and Ha, 2020). Additionally, study conducted on Thai university students reported that a majority of students intentionally sought information on suicide methods, with Google being the most common source followed by local web boards and Facebook (Chompoosri, 2021). As a result, these findings highlight the urgent need for more targeted suicide prevention strategies and policies on college students, that address the specific challenges faced by this population, such as academic pressures and negative self-perceptions.

3. MENTAL HEALTH-RELATED RISK FACTORS FOR SUICIDE

Risk factors are defined as factors that come before the desired outcome and aids in categorizing the population into high and low-risk groups (Franklin et al., 2017). In order to facilitate effective prevention measures against suicide, accurate prediction of these behaviors is essential. As a result, it is highly necessary to highlight risk factors that contribute to suicidal thoughts and behaviors. In general, risk factors for suicide can be categorized into two main groups: personal factors and environmental factors (Yoshimasu et al., 2008). Personal factors encompass individual characteristics such as mental health disorders, substance abuse, and genetic predispositions. Conversely, social factors involve environmental influences such as stressful life events, interpersonal conflicts, or financial stressors. Currently, there is an abundance of synthesis studies exploring risk factors for suicide (e.g., Yoshimasu et al., 2008; Ribeiro et al., 2016; May and Klonsky, 2016). Additionally, these articles suggest that mental health problems emerge as the most prominent risk factors for suicide. Noticeably, results from a meta-analysis by May and Klonsky (2016) demonstrated that mental health problems including depression, PTSD, drug use disorders, and anxiety disorders helps to differentiate between suicidal ideators and suicide attempters. Moreover, a cohort study on suicide rates reported that when adjusted for age and sex, people with serious mental illness have a suicide mortality ratio that is 5 to 10 times higher compared to the general population (Das-Munshi et al., 2017). Accordingly, mental health disorders are among the most prominent risk factors for suicidal behaviors. In the next section, major risk factors associated with mental health will be discussed in detail to provide a comprehensive understanding of their impact on suicidal behaviors.

3.1.Substance use disorders

The DSM-5 defined substance use disorder as a problematic pattern of substance use causing significant impairment or distress, characterized by symptoms such as increased tolerance, withdrawal, unsuccessful attempts to reduce use, and continued use despite adverse consequences (American Psychiatric Association, 2013). Various types of substances, including but not limited to alcohol, nicotine, opioids, stimulants, and sedatives, can cause addiction that leads to abuse (Bonomo and Proimos, 2005). Substance use has been consistently linked to an increased risk of suicide, with

numerous studies highlighting its role as a significant contributing factor to suicidal ideation and behaviors. A meta-analysis on the relationship between substance use disorder and suicidal behaviors also found that there were significant association between substance use disorder with suicidal ideation (OR=2.04, 95% CI); suicide attempt (OR = 2.49 95% CI: 2.00–2.98) and suicide death (OR=1.49, 95% CI: 0.97–2.00) (Poorolajal et al., 2016). In another meta-analysis focus exclusively on youth samples, substance use disorders was shown to significantly predicted suicidality (including both suicidal ideation and attempts) (OR = 2.16, 95%CI 1.57–2.97), and suicidality in turns significantly predicted subsequent substance use disorders (OR = 2.16, 95%CI 1.53–3.04) (Rioux et al., 2021), suggesting a bidirectional relationship. In Japan, the estimated numbers of alcoholics in 2016 was 570,000 (Osaki et al., 2016). This is particularly concerning as alcohol dependence is a prevalent type of substance use disorder in the country.

3.2. Depressive disorders

According to DSM-5, depressive disorders are a group of conditions that have two core symptoms, namely depressed mood and diminished interest or pleasure. The depressive disorders group consists of premenstrual dysphoric disorder, major depressive disorder, persistent depressive disorder (i.e., dysthymia), disruptive mood dysregulation disorder, other specified depressive disorder, unspecified depressive disorder, and persistent complex bereavement disorder (American Psychiatric Association, 2013). A previous meta-analysis showed that the odds ratios of depression symptoms for suicidal ideation, suicide attempt, and suicide death were OR= 1.57 (95% CI=1.45–1.70), OR=1.30 (95% CI =1.23–1.37) and OR=1.28 (95% CI=1.16–1.41) respectively. Additionally, the odds ratios for major depressive disorder diagnosis for suicidal ideation, suicide attempt, and suicide death are OR=2.48 (95% CI=1.32–4.67), OR=2.38 (95% CI=1.84–3.07) and OR=1.50 (95% CI=1.04–2.17) respectively (Ribeiro et al., 2018). In Japan, a community-based study showed that among adults who aged 40-74 years, 16.3% experienced depressive symptoms (Hinata et al., 2023). Another study indicated that depressive symptoms were also common among Japanese employees, with 44.2% of the sample exhibited these feelings (Fushimi et al., 2015).

3.3. Hopelessness

Hopelessness is defined as the anticipation of unfavorable occurrences and/or the absence of favorable occurrences, together with the conviction that the individual lacks agency to change this bleak circumstance (Abramson, Metalsky and Alloy, 1989). While hopelessness is not conventionally viewed as a diagnostic or therapeutic framework within clinical practice, its significance has been increasingly recognized in psychological research. Hopelessness is also viewed as a recurring risk factor across numerous suicide theories, serving as a pivotal psychological factor in understanding the development and progression of suicidal behaviors (which will be further elaborated later). The meta-analysis from Riberio et al. (2018) showed that hopelessness is a significant risk factor for suicidal ideation [weighted mean odds ratio (wOR) = 2.19, 95% CI: 1.60–3.00], suicidal attempt

(wOR = 1.95, 95% CI: 1.59–2.39) and suicide death (wOR = 1.98, 95% CI: 1.46–2.69) (Ribeiro et al., 2018). Studies regarding the relationship between hopelessness and suicidal behaviors are also explored comprehensively in Japan (e.g.: Sueki, 2022; Tsujii et al., 2020), highlighting its significance across cultures. The role of hopelessness in the development of suicidal behaviors will be examined more closely in Chapter II.

3.4.Loneliness

The concept of loneliness refers to a perceived deficiency in the quality or quantity of a person's social relationships. (Perlman and Peplau, 1981). A recent meta-analysis indicated that loneliness significantly predicted both suicidal thoughts and behaviors, with further evidence suggesting that depression served as a mediator in this relationship (McClelland et al., 2020). Interestingly, loneliness is seen as a social problem in Asian countries with high suicide mortality rates like Japan or South Korea. For example, a nationwide study of the general population in South Korea showed that one third of the sample reported feelings of loneliness. Additionally, this study found that Korean individuals experiencing loneliness were significantly more likely to have increased suicidal ideation, suicidal plans, and attempt suicide (Lee et al., 2023). For Japan, feelings of loneliness is especially prevalent in older population. A study on 21,463 older adults demonstrated that 38.4% of them experience feelings of loneliness (Noguchi et al., 2023). Another study conducted among 3165 Japanese adolescences also indicated that loneliness was high among this sample, especially at age 10 (21.8%) and age 16 (18.7%) (Hozozawa et al., 2022). As a result, given the higher rates of loneliness and suicide in countries like Japan, it is imperative to place greater emphasis on research and prevention efforts in these regions.

4. THE CULTURAL ASPECTS OF SUICIDE IN JAPAN

Suicide in Japanese society is indicated to reflect unique cultural influences. Unlike Western countries, Japanese society put a bigger emphasis on social values than individual values (Russell, Metraux and Tohen, 2017). Furthermore, suicide in Japanese history has been associated with a demonstration of loyalty or as a method to clear the feeling of shame and guilt and was seen in the traditional seppuku of samurai (Russell, Metraux and Tohen, 2017). In modern Japanese society, the philosophy of samurai is believed to have been applied to the business world, with seppuku has evolved into two contemporary examples of suicide, which are inseki jisatsu, or "responsibility-driven suicide," and karo jisatsu, or "suicide by overwork." (Pierre, 2015). For example, study showed that many cases of karo jisatsu and karoshi (i.e., death by overwork) are on the rise in Japan due to the stressful work environment (Asgari, Pickar and Garay, 2016). A study on 22 cases of Karo-jisatsu suggested that personnel changes (e.g., a promotion or transfer), low social support, high psychological demand, low decision latitude, and high overtime hours are the main causes of this phenomenon (Amagasa, Nakayama, and Takahashi, 2005). In the case of inseki-jisatsu, suicide typically occurs after a public incident; the person who takes their own life usually holds a socially

prominent position and feels responsible for the incident (Takei and Nakamura, 2004). Additionally, another study comparing Japanese and American college students found that Japanese students reported higher death and suicide proneness than their American counterparts (Saito, Klibert, and Langhinrichsen-Rohling, 2013). In a different study, Japanese also reported to have different attitude toward suicide (Domino and Takahashi, 1991). Specifically, in comparison with American sample, Japanese are more likely to believe that an individual has the right to choose to die, view suicide as normal response to certain situations, and less likely to view suicide as a reflection of anger and aggression.

In exploring Japan's concerning high suicide rate, research regarding underlying social and cultural factors is highly needed. One possible explanation for the suicide crisis in Japan could be the link between an individual's self-image and vulnerability to suicide. While Japanese culture emphasizes social cohesion and conformity, it's possible this very emphasis on a particular social presentation may contribute to feelings of isolation or a disconnect from one's authentic self, potentially increasing suicide risk (Russell, Metraux and Tohen, 2017). This concept also aligns with the Interpersonal Theory of Suicide, which suggests that lack of belongingness and feelings of burdensomeness are the biggest risk factors contributing to suicide (Joiner, 2005; Van Orden et al., 2010). Indeed, in a study of the relationship between self-esteem and suicide rates among 55 nations, Japan exhibited the lowest self-esteem score alongside the fourth highest suicide rates, suggesting a possible correlation between low self-perception and suicide risk in this population (Chatard, Selimbegović, Konan, 2009). Accordingly, the unique cultural influences, social values, and low self-image may affect suicide rates in Japan. The role of self-image in the development of suicidality along with the connection between the ITPS model with Japanese culture will be comprehensively discussed in the latter Chapters.

5. UNDERSTANDING SUICIDE AMONG UNIVERSITY STUDENTS THROUGH THEORIES OF SUICIDE

A theory on suicide could help to identify risk or protective factors by offering a concise and testable framework with multiple facets, effectively explaining the phenomenon while also suggesting practical clinical applications. There are several prominent theories that attempt to explain the development of suicidal behavior over the last century. The major theories of suicide include (but not limited to) The three-step theory of suicide; Durkheim's sociological theory; Escape theory of suicide; Interpersonal theory of suicide; Psychache theory of suicide; and Hopelessness theory of suicide. These theories will be examined individually in the following sections.

5.1.Three-step theory of suicide

The three-step theory of suicide (Klonsky and May, 2015) proposes that suicidal ideation first emerges from a combination of pain (mostly psychological, such as depression or negative self-perception) and feelings of hopelessness. The second step emphasizes the role of connectedness, which refers to one's sense of attachment to others or a purpose in life. Here, connectedness is believed to play a crucial role in determining whether the level of suicidal ideation becomes moderate (in case of high connectedness) or strong (in case of low connectedness). In the final step, suicidal ideation may progress to a suicide attempt if an individual develops three factors that contribute to suicide capacity: dispositional (e.g., blood phobia or pain sensitivity), acquired (i.e., becoming habituated to experiences associated with pain, injury, fear, and death), and practical (i.e., specific elements that facilitate a suicide attempt, such as access to lethal means).

5.2.Implications of the three-step theory of suicide for university students

The Three-Step Theory of suicide can be a helpful tool to understand and potentially prevent suicide in university students. Psychological pain has been commonly demonstrated as a significant predictor of suicidal ideation and even suicide attempt of university students (Lambert et al., 2020; Troister et al., 2013). Specifically, university students' distress often stems from a confluence of factors, including the potential emotional upheaval of leaving home for the first time, the increased academic demands compared to high school, and the dissolution of romantic relationships formed during high schools (Lambert et al., 2020). Hopelessness may also be an indicator of suicide risk among university students. A study revealed that approximately one-fourth of university students occasionally experience feelings of hopelessness and hopelessness is a risk factor for suicidal behaviors among this sample (Oyekcin, Sahin and Aldemir, 2017). In the second step of the theory, a strong social support system acts as a buffering factor against suicidal thoughts. However, university students could feel isolated due to academic workload, living away from home, or difficulty forming close friendships. Although research suggests that social connectedness reduces suicide risk factors in university students, the same study found that these students, particularly first-year students, often experience low levels of connectedness (Drum et al.,2017). The third step of the 3ST, capability for suicide, examines factors that make acting on suicidal thoughts easier. For university students, their newfound independence and environment may increase an individual's access to and knowledge of lethal means, especially through the Internet. A previous study suggested that online platforms frequented by students may facilitate discussions or exchanges of information regarding suicide methods (Chompoosri, 2021).

5.3.Durkheim's sociological theory

Durkheim is usually recognized as the pioneer in the academic study of suicidology (Goldney and Schioldann 2000). Sociological theory of suicide from Durkheim was also perhaps the earliest comprehensive theory of suicide. According to the theory, societies need adequate levels of social

regulation and integration to prevent suicide, particularly during times of social turbulence (e.g., COVID-19 pandemic); when these conditions are lacking, individuals may be driven towards suicidal behaviors. The theory further states that there are four types of suicide, namely, egoistic, altruistic, anomic, and fatalistic: Egoistic suicide results from the perception of social isolation (e.g., suicide from lonely elderly person with no close family or friends); Altruistic suicide stems from strong societal integration, where individuals view their own death as a societal benefit (e.g., suicide for religious cause like suicide bomber); Anomic suicide occurs during societal instability and the individual experience a loss of direction (e.g., suicide after being layoff); Fatalistic suicide arises from oppressive social regulation which cause the individual to perceive their situation as hopeless (e.g., suicide among prisoners) (Mueller et al., 2021). In other words, the theory proposes that suicide is a social issue with too much social integration leads to altruistic suicide; too little social integration leads to egoistic suicide; too little social regulation leads to anomic suicide; and too much regulation leads to fatalistic suicide. Durkheim's model of suicide offers a sociological perspective for the suicide crisis, and supportive evidence for the theory has been long established. For example, a study on Japanese data during a 9-year period revealed that young adults live in municipalities with higher levels of social fragmentation (i.e., refers to the lack of social integration through factors including above-average numbers of non-family households, high residential turnover, and high concentrations of short-term households) were associated with significantly elevated suicide rates (Yoshioka et al., 2021). The theory also offers a novel perspective for suicide during the COVID-19, with altruistic suicide happened in healthcare workers; diminished social integration due to lockdown and restriction may lead to anomic suicide; and excessive societal regulations such as lockdown may precipitate fatalistic suicide (Menon, Padhy and Pattnaik, 2021).

5.4.Implications of the Durkheim's theory of suicide for university students

In terms of the relevance of the theory to suicide among university students, university students' suicide could be fitted into egoistic suicide, anomic suicide, and fatalistic suicide. Durkheim's concept of egoistic suicide can be observed among university students, particularly during their first year away from family when they may feel disconnected from their peers. A previous study on French university students found that over a quarter of the sample reported frequent loneliness, and loneliness was significantly associated with a fourfold increase in suicidal thoughts, independent of major potential confounders (Macalli et al., 2022). Anomic suicide might occur during periods of upheaval in the student's life, such as feelings of uncertainty when about to graduate or experience society crisis when societal norms are unclear such as during the COVID-19 pandemic. Indeed, a previous study demonstrated that fourth year students had significantly higher suicidal ideation, suicide plan, and even suicide attempt in comparison with students from other academic years (Rasheduzzaman et al., 2022). For fatalistic suicide in university students, a study suggested that fatalistic suicide among university students in Korea are influenced by characteristics of the Korean education system, including its competitive academic environment, the extremely challenging

national university entrance exam, and the decisive role of entrance exam scores in determining students' choice of major (Anderson, 2023). Similar factors may also be at play in Japanese education system, which also emphasizes competition and high-stakes exams (Matsuoka, 2017).

5.5.Escape theory of suicide

Another notable framework is the escape theory of suicide (Baumeister, 1990). In this theory, a suicide event is viewed as the result of an attempt to escape from the self. Specifically, suicide event stems from a casual chain of six main steps: (1) An individual only feels suicidal when they first fall short of standards due to either unrealistic expectations or recent setbacks. (2) Next, they attribute these failures as a negative view of self, which is shown through feelings of self-blame or low self-esteem. (3) The individual then becomes highly self-aware due to comparison of the self with relevant standards. (4) Subsequently, negative affect follows the self-awareness such as depression or anxiety would emerge. (5) This would lead to a state called cognitive deconstruction where the individual tries to escape negative affect by rejecting and avoiding meaningful thoughts. (6) Finally, there are consequences of deconstruction that highly relevant to suicide, namely disinhibition, passivity, absence of emotion, and irrational cognitions. While there is limited number of studies attempt to comprehensively assess all six steps of the escape theory of suicide, previous literature has explored individual components, each providing supportive evidence for the theory. For instance, an experimental study revealed that participants assigned to the failure experimental group (versus the success condition) reported a significant increase in the association of suicide-related words with the self, showing supporting evidence for the first step of the theory (Tang, Wu and Miao, 2013). In another study, results demonstrated that low quality of life and self-esteem (which is associated with the first step and the second step of the theory respectively) significantly predicted suicidal ideation among schizophrenia patients (Fulginiti and Brekke, 2015). The escape theory will provide the scientific framework for the analysis of suicidal behaviors in Chapter II.

5.6.Implications of the escape theory of suicide for university students

When applying the theory to college students, setbacks mentioned in the initial step can include events like academic failure or feelings of disconnection from their peers. Consequently, students may choose suicide as a mean of escaping overwhelming psychological distress, stemming from various academic and personal stressors. The escape theory of suicide has been empirically tested in university students in previous studies. For example, a study by Landrault et al. (2020) demonstrated that feelings of failure predicted a significant portion of suicidal ideation among university students, with this effect partly mediated by escape motivation. Another study further suggests that within the sample of university students, the escape theory is not merely a linear causal chain; instead, it indicates that most factors within the theory interact with each other (Dean, Range and Goggin, 1996).

5.7.Interpersonal theory of suicide

The interpersonal theory of suicide was introduced by Joiner (2005), which was later developed further by Van Orden et al. (2010). The theory states that suicide thoughts and ideation first emerged when an individual experience both two dynamic psychological states: thwarted belongingness and perceived burdensomeness. Thwarted belongingness describes the feeling of interpersonal disconnectedness, while perceived burdensomeness is characterized as the perception that oneself is incompetent or a burden on others. However, suicide ideation only transits to suicide attempt when an individual acquires the capability for suicide. Acquired capability refers to a state where there is an increased level of fearlessness and reduced pain sensitivity, leading to a diminished sense of alarm towards suicidal behaviors. According to the theory, the highest risk of a severe or fatal suicide attempt only occurs when all these conditions align. The interpersonal theory of suicide is perhaps the most extensively researched and widely known theory of suicide. A meta-analysis from 2017 showed that there were 122 distinct articles examining the interpersonal theory construct and suicidal behaviors. Results from the meta-analysis supported the theory, indicating that the interaction between thwarted belongingness and perceived burdensomeness significantly related to suicidal ideation; while the interaction between the combined factors of thwarted belongingness, perceived burdensomeness, and capability for suicide significantly predicted the numbers of suicide attempts (Chu et al., 2017).

5.8.Implications of the interpersonal theory of suicide for university students

University students may experience thwarted belongingness, feeling disconnected and lonely amidst challenges in forming meaningful relationships when transits to the university environment. They may also perceive themselves as burdensome due to academic pressures, financial stressors, or interpersonal conflicts. Additionally, similar to the third step of the three-step theory of suicide, university students may acquire the capability for suicide through exposure to lethal means of suicide through the Internet or social media. Numerous studies have been conducted to assess the validity of the interpersonal theory of suicide among university students. For example, study from Becker, Foster and Luebbe (2020) demonstrated that among college students, there was a three-way interaction between burdensomeness, belongingness, and fearlessness about death on suicidal behaviors. In another study, thwarted belongingness and perceived burdensomeness are indicated to predict suicide risk in both U.S. and Korean undergraduate students, suggesting that the theory is cross-culturally relevant and applicable (Suh et al., 2017).

5.9.Psychache theory of suicide

Shneidman's model of suicidal behaviors theorized that suicide is the result of psychache, and a person only commits suicide when they view the psychache as unbearable. In this context, psychache is defined as feelings of "*hurt, anguish, soreness, aching, psychological pain in the psyche, the mind*" (Shneidman, 1993, p. 145). An interesting point of the theory is that it suggest notable risk factors for

suicide like depression or hopelessness only secondary to psychache and only associated with suicide due to their association with psychache. Shneidman further emphasized the subjective nature of psychache, highlighting that the intensity of psychological pain varies from person to person and is influenced by individual experiences, beliefs, and coping mechanisms. A recent systematic review has indicated that psychache is indeed a unique predictor of suicidal ideation, even above depression and hopelessness (Baryshnikov and Isometsä, 2022)

5.10. Implications of the psychache theory of suicide in university students

The psychache theory of suicide has been extensively tested in university students. For example, Troister and colleague first conducted a longitudinal study investigated the role of psychache in the development of suicidality among at risk university students and then replicated the study in both general and high-risk university students. These two studies found that psychache uniquely and significantly predicted suicidal ideation in general and high-risk undergraduates even when depression and hopelessness were controlled (Troister and Holden, 2012; Troiste et al., 2013).

6. COMMON THEMES IN SUICIDE THEORY

Across these theories, common themes consistently emerge, including hopelessness, feelings of burden, loneliness, and social isolation. These recurring factors in the wide array of suicide theories indicate that there is some underlying mechanism that influence the development of suicide behaviors. However, perhaps the most significant recurring theme across these theories is how an individual's perception of themselves could influence the development of suicidal tendencies. Specifically, Durkheim's theory of suicide highlights the impact of individuals' self-perception of how feelings of social integration either too much or too little could lead to suicide. Similarly, in the three-step theory of suicide, individuals' negative self-perception is listed as a possible symptom of pain in the first step (Klonsky and May, 2015). In the Escape theory, individuals' negative view of the self mentioned in the second step drive them to view suicide as a mean of escaping intolerable circumstances or emotional pain (Baumeister, 1990). The role of self-image in the Interpersonal theory can be found in the trait of perceived burdensomeness. According to the theory, perceived burdensomeness consists of two dimensions, namely the view that the self is a liability to others and self-hatred (Van Orden et al., 2010). Finally, in the psychache theory of suicide, Shneidman posits that an individual only decide to commit suicide when the individual views that the psychache has become unbearable (Shneidman, 1993). As a result, it is clear that throughout these theories, the way an individual view or feel about their situation emerges as a central aspect in influencing how suicidal behaviors developed, underscoring its significance in understanding and addressing suicide risk.

7. UNDERSTANDING SELF-IMAGE

The concept of self-image has been discussed as early as the 1890. In the chapter titled “The consciousness of self”, William James, who is considered one of the founding father of American psychology, comprehensively discussed about the self from the psychological point of view (James, 1890). However, the definition of the self by William James is believed to be lacking in clarity due to the ambiguity in his original explanation of the self (Zhao, 2017). Indeed, despite the popularity of psychological research on the self, individual studies often grapple with the construct of the self. The term "self" is also used in varied ways, leading to ambiguity and making it difficult to compare findings across different investigations (Leary, 2004). As a result, it may be necessary to clarify the definition of the self in the current thesis.

According to Leary (2004), there are five distinct ways the terms “self” could be used: First, the word "self" can be used as a synonym to the “person” themselves (e.g., self-grooming). Second, it could be used synonymously with the word "personality," encompassing traits and attributes that distinguish individuals (e.g., self-analysis). Third, "self" can be denoted the self-as-knower, or self-as-subject, focusing on cognition, and how one attention's on and think about oneself (e.g., self-regulation). Fourth, it refers to the self-as-known, or self-as-object involving perceptions and feelings about oneself (e.g., self-verification). Lastly, "self" is viewed as an agent that regulates behavior and makes decisions (e.g., self-control). In this thesis, the primary focus will be on the fourth definition of "self," exploring how people's perceptions, thoughts, beliefs, evaluations, and feelings about themselves influence individual well-being.

The concept of self-image has evolved over time, with many alternative concepts emerging to promote a healthier self-attitude. A wide variety of self-related constructs, such as self-awareness, self-construal, self-esteem, self-affirmation, self-verification, self-presentation, self-regulation, self-rumination, self-compassion, self-efficacy, self-categorization, self-enhancement, self-concept, or self-identity, have been explored in articles published in the journal *Self and Identity* (Leary, 2004). These articles investigate the links between these constructs and various psychological, interpersonal, and cultural phenomena. Building on the concept of "self-as-known" discussed earlier, the following section will delve deeper into two of the most notable self-related constructs: self-esteem and self-compassion.

8. EXPLORING THE ROLES OF SELF-ESTEEM AND SELF-COMPASSION

While there is a wide array of self-concepts, this thesis chooses to focus exclusively on the roles of self-esteem and self-compassion. This emphasis stems from several key reasons: Firstly, both self-esteem and self-compassion play not only an important role in the development of positive mental well-being (Mann et al., 2004; Zessin, Dickhäuser and Garbade, 2015), but they are also often found to be mechanisms of change in psychotherapy. For example, Baer (2010) proposes that self-compassion is the major mechanism of change in mindfulness-based therapy and commitment and

acceptance therapy. Notably, systematic reviews and meta-analysis provide some preliminary evidence for self-compassion role as a mechanism of change for mental well-being in mindfulness-based interventions (e.g.: Gu et al., 2015; van der Velden et al., 2015). In the case of self-esteem, it has been proposed as a potential mechanism of change in CBT (Salkovskis, Sighvatsson, and Sigurdsson, 2023). For instance, studies has shown supportive evidence for self-esteem as the underlying mechanism for obsessive-compulsive disorder in CBT (Toledano et al., 2020; Schwartz et al., 2017).

Secondly, self-esteem and self-compassion reflects positive aspect of the self instead of negative self-evaluation (Britton, 2021), and thus could serve as a protective factor in the development of a healthy mental well-being. For suicide prevention study, it has been suggested that future prevention research might improving its efficacy by prioritizing protective factors over risk factors (Lapierre et al., 2007; Mishara, 2003). Therefore, investigating the roles of self-esteem and self-compassion in suicide prevention is crucial, as these positive self-perceptions may act as buffers against suicidal thoughts and behaviors.

Finally, a substantial body of research has provided empirical evidence for the psychological contributions of self-compassion and self-esteem. The influence of a topic in psychology can be assessed by examining a variety of factors, including the number of meta-analyses conducted on the topic. Indeed, numerous meta-analyses have linked a wide array of mental and physical health outcomes with self-esteem (e.g.: Harris and Orth, 2020; Liang et al., 2024; Pinquart, 2023), and self-compassion (e.g.: Zessin, Dickhäuser and Garbade, 2015; Phillips and Hine, 2021; Turk and Waller, 2020). As far as our knowledge, currently there is a limited body of meta-analysis research on other self-concepts such as self-acceptance, self-regulation or self-blame. Several meta-analyses investigate the role of self-criticism in mental health. For instance, a study by Loew et al. (2020) found that self-criticism is related to psychotherapy outcomes. However, since self-criticism is an aspect of self-compassion, which this thesis will explore in detail later, the current research will focus primarily on the broader construct of self-compassion, rather than specifically examine self-criticism. Additionally, it should be noted that there are also a numerous meta-analyses exploring the connection between self-efficacy with various outcomes. However, self-efficacy falls outside the scope of this thesis due to its focus on an individual's belief in their ability to reach specific outcomes (Bandura, 1997), which doesn't directly align with Leary's (2004) fourth definition of the self.

For the reasons mentioned above, while there are various self-concepts that highly related to the development of mental health, this thesis will focus primarily on self-esteem and self-compassion. This investigation will discuss the contributions of self-esteem and self-compassion to suicide prevention, aiming to understand how these self-perceptions can protect an individual from suicidal behaviors.

8.1. Self-esteem

Self-esteem is perhaps one of the earliest and well-known self-concept constructs. The concept of self-esteem first appeared in William James' 1890 work "The consciousness of self," where he defined it as a ratio between successes and pretensions (i.e., one's goals and aspirations). Following the work of James, Rosenberg further advanced the field by not only proposing an expanded definition but also by developing the Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965b), a crucial tool for empirically studying this important concept. In the book "Society and the Adolescent Self-image" Rosenberg expanded the definition of self-esteem as "*a positive or negative attitude toward a particular object, namely, the self*" (Rosenberg, 1965a, p.30). Rosenberg further stated that low self-esteem "*implies self-rejection, self-dissatisfaction, self-contempt*" (Rosenberg, 1965a, p.31). Rosenberg's definition of self-esteem is widely recognized, making it a highly valuable tool in psychological research.

Rosenberg's work laid the groundwork for a wave of subsequent research on self-esteem, with many authors exploring and refining its definition. For example, Coopersmith expanded the definition of self-esteem as an "*evaluation which the individual makes and customarily maintains with regard to himself: it expresses an attitude of approval or disapproval, and indicates the extent to which the individual believes himself to be capable, significant, successful, and worthy. In short, self-esteem is a personal judgment of worthiness that is expressed in the attitudes the individual holds towards himself*" (Coopersmith, 1967, p.4). While both Coopersmith and Rosenberg define self-esteem as an evaluative attitude, Coopersmith emphasizes specific aspects of self-worth and implies its expression through behavior, whereas Rosenberg focuses on a more general, enduring self-regard. Another well-known definition of self-esteem comes from Branden, a leading researcher of self-esteem, refers to the concept as "*the experience of being competent to cope with the basic challenges of life and being worthy of happiness.*" (Branden, 2001, p. 252). While Rosenberg's definition views self-esteem as a broad internal feeling of self-worth, Branden's definition breaks it down into two specific aspect including perceived competence and feelings of worthiness. Overall, although numerous definitions of self-esteem exist, each offering a unique lens, they all converge on the core idea: the concept of self-esteem reflects an internal evaluation that shapes how worthy we feel.

Together with the varied definitions of self-esteem, several instruments were subsequently developed after the RSES to measure self-esteem. For example, compared to the multi-dimensional RSES, the Single-Item Self-Esteem Scale (SISE) developed by Robins, Hendin, and Trzeniewski (2001) offers a concise measure of overall self-esteem. The SISE employs a 5-point Likert scale for a concise self-esteem assessment with the statement: "*Please indicate to what extent the following statement applies to you: I have high self-esteem*". Another notable scale for self-esteem is Coopersmith self-esteem inventory (Coopersmith, 1987). Unlike the RSES, the CSEI is a longer and

more multifaceted instrument, assessing various domains of self-esteem, including (1) social; (2) academic; (3) family; and (4) personal.

8.2. Self-compassion

The concept of self-compassion has its root in Buddhism. Within the Buddhist framework, the act of compassion is not solely directed outwards towards others' suffering, but also encompasses a crucial element of compassion towards the self. This inclusion is paramount, as the exclusion of oneself from the circle of compassion fosters a fallacious construction of a separate self (Neff and Dahm, 2015). While the concept of self-compassion existed in Buddhist thought for centuries, the formalization of the concept within psychology is a recent development. Specifically, the concept of self-compassion, was first bring to the forefront of psychological research in Kristin Neff's 2003 paper "Self-Compassion: An Alternative Conceptualization of a Healthy Attitude Toward Oneself". In the article, self-compassion is described as mirrors the experience of offering comfort to a friend. This process involves acknowledging our own pain, connecting with others who struggle, and providing ourselves with understanding and support during difficult times. This compassion can be gentle and nurturing, fostering self-acceptance and emotional soothing, or it can be strong and assertive, helping us protect ourselves, meet our needs, and motivate positive change (Nef, 2023a).

The concepts of self-compassion have three main dimensions: self-kindness versus self-criticism; common humanity versus isolation; mindfulness versus over-identification (Neff, 2003a). Self-kindness involves treating yourself with the same warmth, care, and understanding you would offer a close friend going through a difficult time. By treating oneself with kindness, an individual lay the groundwork for self-compassion, fostering acceptance of imperfections, emotional resilience, and openness to support. An example of a self-directed kindness behavior would be when a student failed to deliver a presentation, the person could remind themselves: *"Everyone makes mistakes, and I learned a lot from this experience. I'll focus on what went well and use this experience to refine my presentation skills."* The opposite of self-kindness within the framework of self-compassion is self-criticism, characterized by a tendency towards harsh self-judgment, negativity, and a lack of understanding in the face of personal shortcomings or failures. Using the presentation example above, a self-critical student might think: *"That was awful. I'm such a bad presenter. I'll never be able to do presentations well, and I probably let my whole team down."*

Common humanity is the recognitions that all humans are flawed work-in-progress and experience similar hardships in life. In this aspect, self-compassion encourages us to acknowledge that everyone faces hardships and sufferings, fostering a sense of shared humanity One example to illustrate the concept of common humanity is when feeling discouraged after a failed job interview, a person could say to themselves: *"Many talented people experience rejections. It doesn't mean I'm not good enough. It just means there might be a better fit out there waiting for me. Everyone experiences setbacks, but we keep trying."* In contrast, feeling of isolation involves underestimating how common

similar negative experiences are. This leads to the perception that negative events are isolated to oneself and a feeling of being alone during hardships. An example of an isolated way of thinking when failing a job interview would be: "*This rejection must mean I'm a terrible candidate. Everyone else probably would get the jobs, while I'm the only one who messed up this badly.*"

The final facet of self-compassion is mindfulness, which Neff refers as observing the internal world with a clear and balanced mind, noticing both positive and negative experiences without getting overwhelmed. Neff and Germer (2018) argue that mindfulness is an essential component of self-compassion due to the necessity of first acknowledging and accepting the inner pain and suffering, before being able to respond it with care and kindness. For instances, when stripping and spilling coffee in front of the colleagues, one could try to be with the feelings of embarrassment and aware of the physical sensations such as the flushed face or the pounding heart. Over-identification, as opposed to mindfulness, is defined as the state in which people become so consumed by their negative emotions that they lose sight of other aspects of themselves, like the ability to feel differently or view the situation more positively. In the example of spilt coffee, an over-identified reaction would be instead of acknowledging the awkwardness and moving on, the individual might get stuck in a negative thought loop with thoughts like "*This is the most humiliating thing ever!*". In this state, being over-identified with the negative experience would narrow their perspective, making them feel completely defined by this one embarrassing moment.

For the measurement of self-compassion in research settings, the Self-Compassion Scale (SCS) stands as a widely utilized and validated psychometric tool. Developed by Kristin Neff (2003b), the SCS offers a standardized method for assessing different dimensions of self-compassion. In addition to the original SCS, Neff and her colleagues have developed other versions to broaden its reach, including a short version, a state self-compassion version, and a youth version (Jiang et al., 2023). Other researchers also attempt to expand the measurement of self-compassion with scales like the Single-Item Self-Compassion Scale (measures self-compassion using the statement "*I have high self-compassion*"; Zhang et al., 2022), the Social Self-Compassion Scale (measures self-compassion in the context of social stress; Rose and Kocovski, 2021), or the Self-Compassionate Reactions Scale for Children (measure children's self-compassionate reactions in response to hypothetical scenarios; Zhou et al., 2019). While these scales offer valuable contributions, they lack the widespread recognition of the SCS.

9. THE ROLE OF SELF-ESTEEM AND SELF-COMPASSION IN THE DEVELOPMENT OF HEALTHY MENTAL WELL-BEINGS

How an individual view themselves could also highly affect their own well-being. In fact, the role of self-image in the development of a healthy mental well-being has been emphasized since the 1960s (e.g., Erikson, 1968; Mahler, 1967). Most notably, in his book "Society and the Adolescent Self-Image," Rosenberg, a pioneer of self-esteem research, emphasized that "*the study of self-*

attitudes has greater significance for mental health” (Rosenberg, 1965a, p.12). Accordingly, understanding the impact of self-esteem and self-compassion on mental health allows us to explore strategies for cultivating both.

Cultivating a high self-esteem and self-compassion promotes positive mental health. As mentioned previously, several meta-analyses have linked high self-esteem. (e.g.: Harris and Orth, 2020; Liang et al., 2024; Piquart, 2023) and self-compassion (e.g.: Zessin, Dickhäuser and Garbade, 2015; Phillips and Hine, 2021; Turk and Waller, 2020) with a wide array of health benefits. Furthermore, research suggests that treatments focusing on or incorporating self-esteem or self-compassion as key components demonstrate improved efficacy. A systematic review of the literature suggests evidence for the efficacy of self-compassion interventions in reducing anxiety and depression among young people (Egan et al., 2022). Similarly, a meta-analysis found that CBT interventions based on the Fennell model of low self-esteem significantly reduced depressive symptoms in adults, with similar effects seen in both one-day workshops and weekly sessions (Kolubinski et al., 2018).

Building upon the established link between self-image and mental well-being, it is of great importance to understand the potential mechanisms through which self-esteem and self-compassion may exert their influence on mental health outcomes. For self-compassion, it is possible that a self-compassionate mind may exert its protective effects against psychopathology primarily through the reduction of the negative aspect of self-compassion, namely self-judgment, isolation, and over-identification. Specifically, in her seminal work on self-compassion, Neff (2003a, p.93) highlights that *“Individuals who are self-compassionate should evidence greater psychological health than those with low levels of self-compassion, because the inevitable pain and sense of failure that is experienced by all individuals is not amplified and perpetuated through harsh self-condemnation, feelings of isolation and over-identification with thoughts and emotions”*. Reinforcing Neff's (2003a) suggestion regarding self-compassion, a recent review by Egan et al. (2022) highlights the potential role of decreased self-criticism as the underlying mechanism for the effectiveness of self-compassion interventions. Another review also indicated that self-compassion therapies may be more effective in targeting negative rather than the positive subscales of the SCS (Wilson et al., 2019).

The mechanism through which self-esteem protects against psychopathology is discussed in the transactional model of stress and coping by Lazarus and Folkman (1984). In the theory, self-esteem is considered one of the protective factors that influence the perception of threats and evaluation of possible coping reactions. Specifically, high levels of self-esteem can function as a buffer against stress by attenuating the perceived magnitude of threats and assisting in the selection and implementation of effective coping mechanisms. In line with this stress model, prior research suggests that individuals with higher self-esteem experience a buffering effect during stressful situations, evidenced by lower levels of subjective stress (Chen et al., 2021; Tang et al., 2024).

Individual with positive self-esteem also reduced physiological response when facing stressful situations, as indicated by lower cortisol levels (Pruessner et al., 2004), salivary cortisol response (Tang et al., 2024) and slower heart rates (O'Donnell et al., 2008).

From previous literature, fostering self-esteem and self-compassion emerges as powerful strategies for promoting mental well-being. Additionally, by understanding the mechanisms through which these factors protect against psychopathology, we can develop targeted interventions to cultivate these qualities.

10. THE ROLE OF SELF-ESTEEM AND SELF-COMPASSION IN THE PREVENTION OF SUICIDALITY

Self-esteem and self-compassion are also inversely related to suicidal behaviors. For instance, a meta-analysis by Suh and Jeong (2021) found a moderate negative correlation ($r = -0.34$) between self-compassion and suicidal behaviors. Similarly, another study by Soto-Sanz et al. (2019) showed a moderate effect size ($d = 0.58$) linking lower self-esteem with higher risk of suicidal behaviors in youth. While the importance of self-esteem and self-compassion in suicide prevention is briefly introduced here, Chapters I, II, and III will explore their specific roles.

11. THE PURPOSE OF THE CURRENT THESIS

Suicide is a prevalent social and public health concern with devastating consequences. While numerous factors contribute to suicidal ideation and behavior, self-image emerges as a crucial element. A growing body of research suggests a significant connection between self-esteem along with self-compassion and suicidal behaviors. Building upon this existing literature, the present thesis would examine the role of self-image, especially self-esteem and self-compassion, in suicide prevention. This exploration will be conducted across three interconnected chapters.

In the first chapter entitled **“Systematic review and meta-analysis of self-esteem-related interventions in reducing suicidal behaviors”**, the thesis would investigate the effectiveness of interventions that incorporate self-esteem enhancement in reducing suicidal behaviors. The first chapter will be designed as a systematic review and meta-analysis, utilizing articles of databases from Google Scholar, PubMed, Web of Science, and PsychInfo.

In the second chapter titled **“Relationship between self-esteem and suicidal ideation before and during COVID-19 in a non-clinical sample: mediating effects of psychological distress and hopelessness”**, the thesis would examine the relationship between self-esteem and suicidal ideation, particularly during a major crisis like the COVID-19 pandemic, while considering how psychological distress and hopelessness might play a role in this relationship. The study employed a non-clinical sample of Hokkaido University students and utilized mediation analysis.

In the final chapter **“Feasibility and acceptability of an intervention through enhancement of self-esteem and self-compassion in university students at risk for suicide”**, the thesis would focus on develop and examine the feasibility, acceptability and efficacy of a suicide prevention program through enhancement of self-esteem and self-compassion. The study’s population would be students from Hokkaido University who are at risk of suicide.

By exploring the multifaceted relationship between self-esteem, self-compassion and suicide prevention across these chapters, this thesis aims to contribute valuable insights to this critical area of research. This knowledge could ultimately inform the development of more comprehensive and effective suicide prevention strategies, particularly for young adults.

CHAPTER I: SYSTEMATIC REVIEW AND META-ANALYSIS OF SELF-ESTEEM-RELATED INTERVENTIONS IN REDUCING SUICIDAL BEHAVIORS

1. INTRODUCTION

1.1.The importance of conducting a systematic review and meta-analysis in clinical research

According to the Cochrane Handbook, a systematic review "*attempts to collate all empirical evidence that meets prespecified eligibility criteria to answer a specific research question. It employs explicit and systematic methods chosen to minimize bias, thereby yielding more reliable findings that can inform conclusions and decision-making*" (Higgins et al., 2019, p.6). A meta-analysis is then defined as a statistical technique that combines the results of multiple independent studies to provide a comprehensive understanding of a research question and first appeared in literature in 1976 (Conn, 1997). In clinical research, systematic reviews and meta-analysis combine data from multiple studies to create a stronger, more reliable picture of the evidence. This comprehensive approach reduces bias, strengthens evidence for a specific treatment approach, and reveals trends across studies, ultimately informing better healthcare and research decisions (Siddaway, Wood and Hedges, 2019). As a result, to establish a robust foundation for an intervention study on self-esteem and self-compassion-based promotion for reducing suicidal behaviors in university students, the thesis will first conduct a systematic review and meta-analysis of existing research.

1.2.Limited Research on Self-Compassion Interventions for Suicide Prevention

Before focusing on a synthesis of self-esteem-intervention in the reduction of suicide, it should be noted that at the current of writing, research specifically focused on self-compassion-based interventions for suicide prevention remains scarce. When performing a preliminary search on the PubMed database using the keywords "self-

esteem" and "suicid*" (the asterisk captures all variations of the term "suicide," such as suicidal or suicidality) with article types limited to clinical trials and randomized controlled trials, and searching Title/Abstract only, we identified 41 results as of May 23, 2024. In contrast, a similar search using the keywords "self-compassion" or "compassion" and "suicid*" with the same filters for article type and searching Title/Abstract only, yielded only 5 articles, with only one study directly investigated the intended theme. This suggests a significant gap in research directly investigating self-compassion-based interventions for suicide prevention. However, observational studies investigating the relationship between self-compassion and suicide risk are well-established. This connection is supported by a meta-analysis by Suh and Jeong (2021), which reported a moderate negative association between self-compassion and suicidal thoughts and behaviors, suggesting that greater self-compassion may act as a protective factor. As a result, while the present thesis cannot conduct a systematic review and meta-analysis of self-compassion interventions for reducing suicidal behaviors due to the lack of existing studies, previous observational studies suggest a promising avenue for suicide intervention studies that focus on promoting self-compassion.

1.3.Exploring current suicide prevention research

From the Literature review, it is clear that suicide is a significant public health concern and further investigation into effective prevention and intervention strategies are highly needed. A meta-analysis of RCTs from the last five decades revealed that while interventions were effective in reducing suicidal thoughts and behaviors, the effect size was small across all studies (Fox et al., 2020). This result was similarly replicated in another review using the adolescent population over 26 years (Itzhaky et al., 2022). These studies suggested that future suicide intervention research should use different approach and focus on targeting the underlying mechanism of suicide (Fox et al., 2020; Itzhaky et al., 2022).

As mentioned in the Literature Review, one possible mechanism for suicide is self-esteem. Low self-esteem is associated with negative mental health consequences and has been linked with 21 different disorders in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as diagnostic criteria, associated features, risk factors or consequences (Kolubinski et al., 2018). On the other hand, high self-esteem has been shown to predict positive mental well-being, including higher levels of happiness (Baumeister et al., 2003), life satisfaction (Moknes and Espnes, 2013) and self-enhancement tendencies (Bosson et al., 2003). A unique characteristic of self-esteem is that it is susceptible to change, especially among children and adolescents (Haney and Durklak, 1998; Orth and Robins, 2014). Thus, due to the strong association between self-esteem and mental health outcomes, and the malleable nature of self-esteem, self-esteem-based interventions might potentially be able to improve mental health (Mann et al., 2004).

The relationship between self-esteem and suicide has been researched extensively in the past few decades. Low self-esteem has been identified as one of the most significant risk factors for suicide risk and suicidal behaviors (Overholser et al., 1995; Brausch et al., 2014; Wild, Flisher and Lombard, 2004; Mitsui et al., 2014). Furthermore, self-esteem was shown to have a unique relationship with suicidal ideation beyond what could be explained by depression and hopelessness, which are two of the most common risk factors for suicide (Overholser et al., 1995). In another study, low self-esteem in childhood was suggested to be a significant risk factor for the development of suicidal ideation in young adulthood (McGee, Williams and Nada-Raja, 2001). In contrast, high levels of self-esteem have been indicated to mitigate suicide risk (Sharaf, Thompson and Walsh, 2009). Thus, increasing self-esteem has been suggested as an effective treatment against suicide-related behaviors (Hawton, Saunders and O'Connor, 2012; Kheibari and Cere, 2021; Stivers, 1990).

So far, only one meta-analysis has explored the relationship between self-esteem and suicide (Soto-Sanz et al., 2019); it reported that low self-esteem is a significant risk factor for suicide attempts in youth. Additionally, there are several reviews that attempted to examine the effectiveness of self-esteem interventions but with some limitations (Kolubinski et al., 2018; Haney and Durlak, 1998; Niveau, New and Beaudoin, 2021; O'Mara et al., 2006). First, two reviews (Haney and Durlak, 1998; O'Mara et al., 2006) defined self-esteem interventions as interventions comprising an outcome measure of self-esteem. While this inclusion criterion could increase the number of included studies, this is problematic as it is likely that self-esteem enhancement happened incidentally in the included studies and not as one of the treatment targets. Furthermore, it could make it difficult to determine whether changes in self-esteem in fact lead to better treatment outcomes. Second, three reviews (Haney and Durlak, 1998; Niveau, New and Beaudoin, 2021; O'Mara et al., 2006) focused only on the effectiveness of self-esteem interventions on the self-esteem outcome while ignoring other psychological outcomes. Since self-esteem interventions are likely to increase self-esteem, it is beneficial to also consider how the interventions improve other psychological outcomes. Kolubinski et al.'s (2018) review is the only exception that did not suffer from the above-mentioned issues. They suggested that a CBT treatment based on Fennell's cognitive model of low self-esteem can significantly improve self-esteem and may also be effective against depression. Notably, to date, no systematic review or meta-analysis has investigated the effectiveness of treatment focused on self-esteem in suicide prevention.

1.4. Purpose of the current chapter

In summary, previous literature demonstrates that self-esteem is an important factor in the development of suicidal behaviors. Despite this evidence, the effectiveness of self-esteem-based interventions in prevention of suicidal behaviors remains unclear. Thus, the present review and meta-analysis aims to investigate whether treatment incorporating self-esteem enhancement is an efficacious approach to suicide prevention.

This review distinguishes itself from previous reviews in several ways. First, this chapter include only those studies that incorporate self-esteem as a treatment target in the intervention program, regardless of whether or not self-esteem is measured as an outcome. Thus, in the current thesis, these types of interventions is called self-esteem-related interventions instead of self-esteem interventions like previous reviews. Second, the current review includes only those studies that have a suicidal outcome, such as suicidal ideation, suicide plan, or non-suicidal self-injury (NSSI). While NSSI and other suicidal behaviors are often differentiated, previous studies and theories have also shown that these two types of behaviors can often co-exist. For example, the role of NSSI is emphasized in Joiner's theory of suicide, which states that NSSI could directly increase an individual's acquired capability for suicide by making them accustomed to fear and pain (Hamza, Stewart and Willoughby, 2012).

The current review and meta-analysis have two aims:

- (1) To investigate the types of treatment or methods used to enhance self-esteem in suicide prevention.
- (2) To evaluate the effectiveness of interventions that incorporate self-esteem enhancement for reducing suicidal behaviors.

2. METHODS

This review and meta-analysis were conducted line with the PRISMA recommendations (Moher et al., 2009) for reporting systematic reviews and meta-analyses. The protocol for this review was registered with the PROSPERO database, registration number CRD42021250882. The research strategy was developed following the Patient, Intervention, Comparison and Outcome (PICO) guideline. In the current review, patients were those who experienced suicidal behaviors and participated in a suicide prevention program using a self-esteem-related intervention. The target intervention was any psychological intervention that incorporated a self-esteem

component. As mentioned in the Literature review, self-esteem is defined in the present study as a “*positive or negative attitude toward a particular object, namely, the self*” (Rosenberg, 1965a; p. 30). Following this definition, interventions that included other related self-concept (e.g.: self-worth, self-criticism or self-image) in its treatment program were also included in this review. The comparison group was not limited or specified, and any type of comparison could be included. For outcomes, selected studies must include measures of suicidal thoughts and behaviors.

2.1. Literature Search

Search terms were developed to identify studies that assessed the effectiveness of self-esteem-related psychological interventions in reducing suicidal behaviors. The key search terms included: (self-esteem or self-concept or self-perception* or self-identit* or self-crit* or self-attack* or self-worth or self-efficacy or self-image) and (intervention* or program* or lesson* or treatment* or psychotherapy or psychoeducation) and (suicid*). These terms were searched in the PsycINFO, PubMed and Web of Science databases for publications from inception to 29 May 2021. In addition, the clinical trial register database (www.clinicaltrials.gov) was searched to detect additional studies that had not yet been published. Similar reviews investigating the effectiveness of self-esteem interventions were also scanned for related studies. Finally, backward and forward reference searching was conducted using the included studies. In the PsycINFO and PubMed databases, Medical Subject Headings or MeSH terms were also added. The search was performed by the thesis’s author and the advisor. A second database search was undertaken on 20 May 2024 by the thesis’s author; no new article was found.

2.2. Selection of Studies

Studies were included if they met all the following criteria:

- (a) Stated that one of the main targets is to enhance self-esteem (or related self-concepts)

(b) Reported suicide-related outcomes. Suicide-related outcome here includes (1) suicidal ideation, defined as the thoughts about engaging in suicidal behaviors; (2) suicide attempt, defined as an act which leads to a non-fatal outcome but with an intention die; (3) suicide plan, defined as a serious planning about how one would kill oneself; and (4) NSSI, defined as the deliberate, self-inflicted destruction of body tissue without the intention of suicide

(c) Used a randomized controlled trial (RCT) study design

(d) Published in a peer-reviewed journal

(e) Full text is available in English

Studies were excluded if they met any of the following criteria:

(a) Were not intervention studies (e.g., case studies, qualitative studies).

(b) Did not include a self-esteem component in the intervention program

(c) Did not report the assessment of a suicide-related outcome.

(d) Did not follow an RCT study design.

(e) Not published in a peer-reviewed journal (e.g., dissertation)

(f) Full text is not available in English

2.3. Data Extraction

The following information was extracted from the articles to a spreadsheet: author names, year of publication, intervention design, duration, sample size, setting, diagnostic criteria, mean age and gender composition, country, co-morbidity, control group, number of participants in each group, outcome measures on suicidal behaviors, and outcome assessment timepoints. Data extraction was conducted by the first author and checked by the second author. When required data were unavailable, we emailed the corresponding author of the concerned article and requested access to missing data.

2.4. Risk of Bias

Cochrane Collaboration's tool for assessing risk of bias in randomized trials (Higgins et al., 2019) was used in the current review, which assessed the following domains: (a) sequence generation; (b) allocation concealment; (c) blinding of participants, personnel, and outcome assessors for each outcome; (d) incomplete outcome data; and (e) selective outcome reporting. It has been suggested that an overall judgment about the level of bias should not be made and a specific score should not be assigned, as different forms of bias are likely to be relevant depending on the nature of the research (Higgins et al., 2019). Therefore, risk of bias for all criteria was reported individually in the current review.

2.5. Data Synthesis and Analysis

The included studies were synthesized and summarized narratively. Studies suitable for meta-analysis were included and analyzed using Review Manager (RevMan, version 5.4).

Meta-analysis was conducted to determine the effectiveness of interventions on suicidal outcomes. Standardized mean difference (SMD) was calculated due to the differences in the measurement scale. The SMD was calculated for post intervention and follow-up using Hedges' adjusted g. At post intervention, SMD was calculated for suicidal ideation. Follow-up data were sparse and varied in follow-up duration (ranging from 4 weeks to 6 months). However, four studies reported results for suicidal ideation at 3-month follow-up; thus, these data were also included in the meta-analysis. Meta-analysis was conducted using a random-effect model as opposed to a fixed-effect model because studies used a wide range of interventions and designs.

I² was calculated to assess for heterogeneity in treatment effects. According to Cochran's guideline (Higgins et al., 2019), I² can be interpreted as non-significant heterogeneity (0–40%); moderate heterogeneity (30–60%); substantial heterogeneity (50–90%) and considerable heterogeneity (75–100%).

3. RESULTS

3.1. Studies Included in the Review

Figure 1 illustrates the PRISMA flowchart for the study selection process. The database search identified 3,608 articles (2,898 articles after removing duplicates). Next, titles and abstracts were screened by the thesis's author to determine their suitability. Through this initial check, 195 papers were selected for screening of full text by the thesis's author and their advisor. Disagreements between the authors were discussed until consensus was reached. A total of nine studies were found to meet the inclusion criteria after screening of the full text. Additionally, two studies (Brenner et al., 2016; Franklin et al., 2016) were identified from (a) backward citation searching of an included study (Hooley et al., 2018) and (b) forward citation searching of an included study (Simpson et al., 2011). An additional study (Clore and Gaynor, 2006) was found through a scan of a similar systematic review (Niveau, New and Beaudoin, 2021). Thus, a total of 12 papers were included in this review.

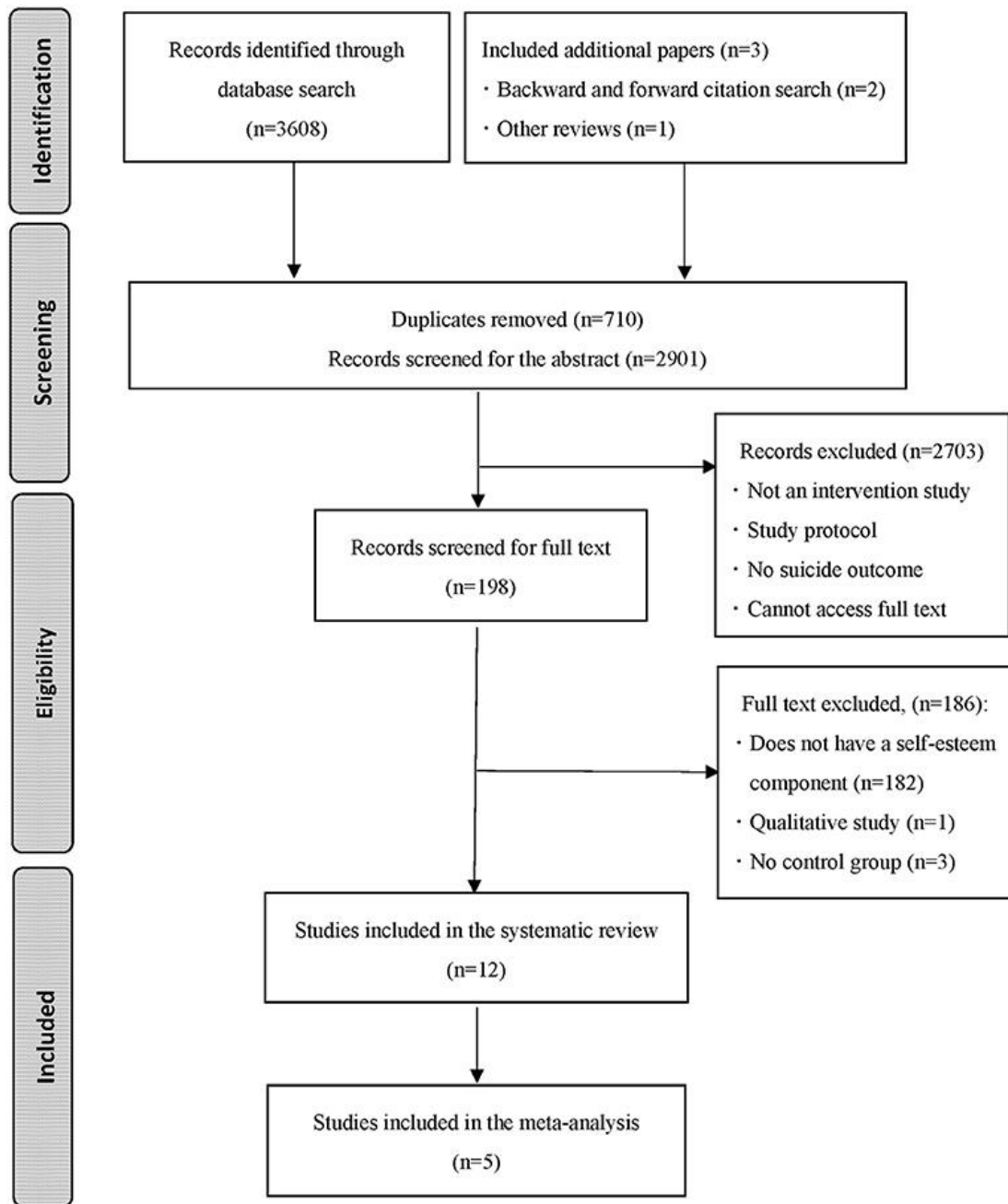


Figure 1. PRISMA flowchart for the process of study selection

3.2.Study Characteristics

The total number of participants in the studies was 1,391. The sample sizes at baseline ranged from 17 to 341 ($M = 100.35$). One study (Pratt et al., 2015) used an all-male sample, and two studies (Simpson et al., 2011; Randall et al., 2001) did not report the gender distribution of the sample. When studies that used an all-male sample or did not report the gender distribution of the sample were removed, the average percentage of females for all studies was 66.52%. Nine studies were conducted in the United States (Brenner et al., 2018; Franklin et al., 2016; Hooley et al., 2018; Clore and Gaynor, 2006; Randell et al., 2001; Czyz et al., 2019; MacPherson et al., 2018; Pachankis et al., 2020; Thompson et al., 2000), one in the United Kingdom (Pratt et al., 2015), one in Korea (Jun et al., 2014) and one in Australia (Simpson et al., 2011). The mean age of the samples ranged from 15.42 to 51.86 years, with four studies (Randell et al., 2001; Czyz et al., 2019; MacPherson et al., 2018; Thompson et al., 2000) using child or adolescent samples (aged under 18 years), four (Franklin et al., 2016; Hooley et al., 2018; Clore and Gaynor, 2006; Pachankis et al., 2020) using young adult samples (aged 18–25) and four (Brenner et al., 2018; Simpson et al., 2011; Pratt et al., 2015; Jun et al., 2014) using adult samples (aged over 25 years). One study (Randell et al., 2001) did not report the mean age of the sample but stated that it comprised student in Grade 9–12. Detailed information on sample demographics and study population is given in Table 1.

Table 1. Sample characteristics

Study	Participants (female)	Country	Population	Mean Age (years)
Brenner et al., 2018	34 (2)	USA	Veterans with moderate to severe traumatic brain injury	51.6 (10.7)
Clore and Gaynor, 2006	30 (22)	USA	Undergraduate students from a large American university who reported significant distress and low self-esteem	21.10 (5.11)
Czyz et al., 2019	36(28)	USA	Adolescents hospitalized due to suicide risk	15.42 (1.36)
Franklin et al., 2016	114(92) 131(97) 163 (96)	USA	Participants recruited from online web forums on self-injury or psychopathology	23.02(5.47) 22.91 (4.99) 24.5 (6.61)
Hooley et al., 2018	144 (123)	USA	Participants recruited from online forums related to self-injury and severe psychopathology	25.63 (5.83)
Jun et al., 2013	45 (22)	Korea	Hospitalized patients with mental illness	44.95 (15.54)
MacPherson et al., 2017	72 (30)	USA	Children with pediatric bipolar disorder	9.22 (1.59)
Pachankis et al., 2020	108 (76)	USA	Sexual minority young adults	23.68 (3.11)
Pratt et al., 2015	62 (0)	UK	Male prisoners	35.2 (11.10)
Randell et al., 2001	341 (Not reported)	USA	Students in grades 9–12	Not reported

Simpson et al., 2011	17 (Not reported)	Australia	Participants with severe traumatic brain injury with posttraumatic amnesia	41.88 (11.92)
Thompson et al., 2000	108 (58)	USA	High-risk youths in grades 9–12	15.86 (1.03)

3.3.Intervention Characteristics

Individual study characteristics are reported in Table 2. The majority of studies focus on self-esteem as a treatment target, with others focusing on related self-concepts, including self-criticism, self-determination, self-efficacy, self-image, self-affirmation, and self-worth. Most of the studies used modified interventions based on existing techniques or theoretical models. Two studies used an intervention focused specifically on changing self-perception through writing (Hooley et al., 2018; Pachankis et al., 2020). One study used an online intervention based on a therapeutic evaluative condition to increase aversion toward suicidal behaviors and reduce self-criticism (Franklin et al., 2016). One study used a safety planning and motivational interviewing approach based on self-efficacy and self-determination theory (Czyz et al., 2019). One study compared the effectiveness of restructuring negative self-thoughts using thought record and strengthening positive self-statements using flashcard rehearsal (Clore and Gaynor, 2006). Other studies incorporated changing self-esteem as part of a treatment using either cognitive behavior therapy (Brenner et al., 2018; Simpson et al., 2011; Pratt et al., 2015; Czyz et al., 2019; Jun et al., 2014) or safety planning (Randell et al., 2001; Thompson et al., 2000).

Table 2. Intervention characteristics

Study	Theoretical model	Program outline Self-esteem component	Duration Assessment time points	Control group Delivery method	Suicidal outcomes/ Suicide scale
Brenner et al., 2018	CBT (Self-esteem)	Program outline: Window to Hope program is based on principles and techniques from cognitive behavior therapy. Self-esteem component: Session 9 'Building Hope' focuses on building self-esteem	-10 weekly 2 hours sessions -Pre/3/6months	-F2F Group -Waitlist control	Suicidal ideation: BSS
Clore and Gaynor, 2006	CBT (Self-esteem)	The study compared two conditions (a) restructuring of negative self-thoughts (via training and daily practice using the Thought Record) and (b) enhancement of positive self-statements (via fluency training and daily flashcard rehearsal)	-Three weekly sessions. -Pre/post/5 weeks	-F2F Individual -Active control: The study compared between restructuring negative self-thoughts using thought record and enhancing positive self-statements through flashcard rehearsal.	Suicidal ideation: Items 9 and 39 from the Brief Symptom Inventory and item 9 from the Beck Depression Inventory-II
Czyz, et al., 2019	Safety planning and motivational interviewing (Self-determination Self-efficacy)	The full program is based on self-determination theory and self-efficacy theory.	-Not reported -Pre/1/3months	-F2F Individual and family -TAU: Recovery action plan, including crisis management strategies and safety planning.	Suicidal ideation and attempts: C-SSRS
Franklin et al., 2016	Therapeutic Evaluative Condition (Self-criticism)	A main focus of the treatment is reducing aversion toward the self.	-Participants can access the online treatment as desired over the course of one month. -Pre/post/2 months	-Online self-practice -Active: TEC, which displays neutral images	NSSI/suicidal ideation/suicide plan/suicidal behaviors: SITBI
Hooley et al., 2018	Writing interventions (Self-criticism Self-worth)	Autobiographical Self-Enhancement Training (ASET) -- a novel, cognitive intervention for NSSI focused on reducing self-criticism and enhancing positive self-worth	-28 days. Participants write for five minutes each day. -Pre/post/1/3 months	-Online self-practice -Active: Expressive writing; Active: Daily journaling	NSSI/suicidal ideation/suicide plan/suicidal behaviors: SITBI
Jun et al., 2013	CBT (Self-image)	Session 2 focuses on establishing a positive self-image	-8 60 minutes sessions over 4 weeks -Pre/post	-F2F Group -TAU: medications, activity therapies, and supportive counselling by	Suicide ideation: SITBI

MacPherson et al., 2017	Child and family focus - CBT (Self-esteem)	A manualized, family-based intervention CBT with psychoeducation and complementary mindfulness and interpersonal techniques. The component 'I can do it' focuses on improving children's self-esteem and parents' self-efficacy	-12 weekly 60–90 minutes sessions -Pre/4/8/12/39 weeks	doctors and nurses -F2F Family -TAU: TAU session were not manipulated in terms of content or structure	Suicide behaviors NSSI: C-SSRS Non-suicidal physical self-damaging Acts
Pachankis et al., 2020	Writing intervention (Self-affirmation)	Writing intervention using self-affirmation prompts.	-Up to three sessions across three consecutive days -Pre/post/3 months	-Online self-practice -Active: Expressive writing prompts; Active: Control writing prompt (Write about daily activities)	Suicidal ideation: Suicidal ideation attributes scale
Pratt et al., 2015	Cognitive-behavioral suicide prevention therapy (Self-esteem)	One of the five component focus on improving self-esteem and positive schema.	-Up to 20 1-hour sessions, delivered twice weekly during the initial phases and once weekly when therapeutic engagement had been established. -Pre/4/6 months	-F2F Individual -TAU: received the usual care and support available	NSSI/suicidal ideation/suicide potential: BSS
Randell et al., 2001	Life skills training (Self-esteem)	Life skills training program CAST (Coping and Support Training). Provide specific skills training in building self-esteem	-12 1-hour sessions over 6 weeks -Pre/4/10 weeks	-F2F Group -Active: C-CARE Experimental Condition (Comprehensive assessment of risk and protective factors and a brief motivational counseling intervention); TAU	Suicidal behaviors: The high school questionnaire
Simpson, et al., 2011	CBT (Self-esteem)	Window to Hope program (WtoH) based on principles and techniques of CBT. Session 9 'Building Hope' focuses on building self-esteem	-10 weekly 2-hour sessions -Pre/post/3 months	-F2F Group -Waitlist control	Suicidal ideation: BSS
Thompson et al., 2000	Social support and life skills training (Self-esteem)	Personal Growth Class (PGC). One of the elements is, life-skills training, focusing on four core program components (self-esteem enhancement; decision making; anger, depression, and stress management; and interpersonal communication)	-Daily 55- minute sessions from 18 to 36 weeks -Pre/post/5 months	-F2F Group -Assessment only	Suicide risk behaviors: Suicide risk behaviors scale

Note. BSS = Beck Scale for Suicide Ideation; CBT = Cognitive behavior therapy; C-SSRS = Columbus-Suicide Severity Rating Scale; F2F = Face to face; NSSI = Non-suicidal self-injury; PBD = Pediatric bipolar disorder; SITBI = Self-injurious thoughts and behaviors interview; TAU = Treatment as usual.

All studies were RCTs with nine (Brenner et al., 2018; Franklin et al., 2016; Simpson et al., 2011; Clore and Gaynor, 2006; Pratt et al., 2015; Czyz et al., 2019; MacPherson et al., 2018; Thompson et al., 2000; Jun et al., 2014) using a two-arm design and three (Hooley et al., 2018; Randell et al., 2001; Pachankis et al., 2020) using a three-arm design. In terms of the control group, two studies (Brenner et al., 2018; Simpson et al., 2011) compared the treatment with a wait-list control, four (Pratt et al., 2015; Czyz et al., 2019; MacPherson et al., 2018; Jun et al., 2014) used treatments as usual, four (Franklin et al., 2016; Hooley et al., 2018; Clore and Gaynor, 2006; Pachankis et al., 2020) used an active control, one (Thompson et al., 2000) used assessment only, and one (Randell et al., 2001) used both active and treatment as usual. In terms of delivery method, five studies (Brenner et al., 2018; Simpson et al., 2011; Randell et al., 2001; Thompson et al., 2000; Jun et al., 2014) reported that treatments were delivered in groups, two studies (34, 35) delivered treatment to individuals, three studies (Franklin et al., 2016; Hooley et al., 2018; Pachankis et al., 2020) used self-practice, one (MacPherson et al., 2018) was implemented as a family intervention, and one (Czyz et al., 2019) combined both family and individual sessions. Additionally, in nine studies (Brenner et al., 2018; Simpson et al., 2011; Clore and Gaynor, 2006; Pratt et al., 2015; Randell et al., 2001; Czyz et al., 2019; MacPherson et al., 2018; Thompson et al., 2000; Jun et al., 2014) the intervention was delivered face to face and in three (Franklin et al., 2016; Hooley et al., 2018; Pachankis et al., 2020) it was delivered online. Treatment ranged from 3 to 36 sessions, with the sessions in most studies

delivered one or twice weekly. Sessions typically lasted for 1 h. Follow-up timepoints were reported in 11 studies and varied from 4 week to 39 weeks.

Different suicidal behaviors were used in the included studies, with some reporting multiple suicidal outcomes. Specifically, nine studies measured suicidal ideation, four reported results for NSSI, five reported suicidal behaviors, two reported suicide plan, one reported suicide attempt, and one reported suicide potential. Most studies measured suicidality using the Beck Scale for Suicide Ideation ((Beck, Kovacs and Weissman, 1979). Other measurements such as Columbia-Suicide Severity Rating Scale (Posner et al., 2011) or Self-Injurious Thoughts and Behaviors Interview (Nock et al., 2007), were also reported.

3.4. Quality of Included Studies

The overall evaluation of risk of bias is reported in Figure 2. Sequence generation method was described in detail and appropriately used in five studies, was unclear in four studies and was evaluated as high risk in two studies. Allocation concealment had the highest proportion of unclear risk of bias except for three studies where it was rated as low risk. Blinding of participants and personnel also showed high unclear risk of bias, with five studies rated as low risk. In terms of blinding of outcome assessment, five studies were evaluated as low risk, three as high risk and four as unclear. Risk of bias for incomplete outcome data was evaluated in most studies, with seven studies rated as low risk, four as high risk, and only one was rated as unclear. For selective reporting, three studies published a protocol and thus we were able to compare and confirm their outcomes. One study (Clore and Gaynor, 2006) reported each outcome in detail, so it was also rated as low risk. The other eight studies were rated as high risk. Hooley et al.'s study (2018) had the lowest proportion of risk of bias with five out of six domains rated as low risk. Randell et al.'s (2001) study appears to be the weakest with four domains rated as having high risk of bias. MacPherson et al.'s (2018) study had the most unclear risk of bias with five domains rated as unclear.

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)
Brenner et al., 2018	+	+	+	+	-	?
Clore & Gaynor, 2006	?	?	?	+	+	+
Czyz et al., 2019	+	?	?	?	+	?
Franklin et al., 2016	+	?	+	-	-	?
Hooley et al., 2018	+	?	+	+	+	+
Jun et al., 2013	-	?	?	-	+	?
MacPherson et al., 2018	?	?	?	+	?	?
Pachankis et al., 2020	?	?	?	?	+	+
Pratt et al., 2015	+	+	+	+	-	+
Randell et al., 2001	-	?	?	-	-	-
Simpson et al., 2011	+	+	+	?	+	?
Thompson et al., 2000	?	?	?	?	+	-

Figure 2. Risk of bias summary

3.5. Overview of Meta-Analyses on Outcome Measures

Necessary data for six studies (Hooley et al., 2018; Pratt et al., 2015; Randell et al., 2001; Czyz et al., 2019; MacPherson et al., 2018; Thompson et al., 2000) were not available and one study (Clare and Gaynor, 2006) used comparisons between two self-esteem conditions; thus, these studies were excluded from the meta-analysis. Additionally, Franklin et al. (2016) reported the data for suicidal behaviors as the sum of suicidal behavior frequencies during each week of the treatment and post-treatment month; thus, their study was also excluded from the meta-analysis. The corresponding authors of the six papers that did not include the necessary data for meta-analysis were contacted via email and requested to provide these data. Hooley et al. (2018) replied and the data from their study were included in the analysis. The other five did not respond and their studies were excluded from the meta-analysis, though not from the systematic review.

Only data for suicidal ideation was available for the meta-analysis. Follow-up data were available for most studies included in the meta-analysis but with different follow-up timepoints. Following Cochrane's recommendation (Higgins et al., 2019), data at 3-month-follow-up for suicidal ideation was extracted for the meta-analysis.

3.5.1. Effects on Suicidal Ideation at Post Intervention and 3-Month Follow-Up

A total of five comparisons ($N = 289$) from four studies compared a self-esteem-related intervention to a control group at post-intervention. Results revealed that compared with the control condition, the participants in the self-esteem-related interventions experienced a small but significant reduction in suicidal ideation [$g = -0.24$, 95% CI $(-0.48, 0.00)$; Figure 3]. The heterogeneity between groups was non-significant and small ($I^2 = 5\%$, $p = 0.38$).

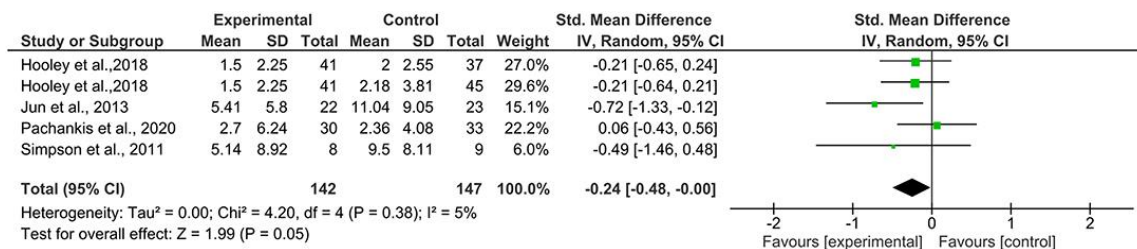


Figure 3. Effects on suicidal ideation at post-intervention

Data for 3-month follow-up for suicidal ideation were available from four studies with five comparisons ($N = 253$). The meta-analysis at 3-month follow-up also yielded a small but significant effect size [$g = -0.36$, 95% CI (-0.62 , -0.11); Figure 4], showing that the treatment condition was more effective at reducing suicidal ideation. Heterogeneity was low and non-significant ($I^2 = 0\%$, $p = 0.41$).

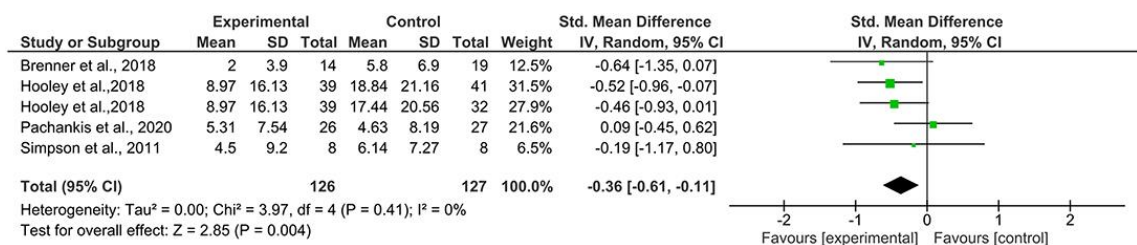


Figure 4. Effects on suicidal ideation at 3-month follow-up

4. DISCUSSION

To our knowledge, this is the first systematic review and meta-analysis investigating the effectiveness of self-esteem-related interventions in reducing suicidal behaviors. The database search yielded 12 RCTs studies that used a self-esteem related intervention for suicidality. Among them, only five studies provided sufficient data for the meta-analysis.

The results of the meta-analysis revealed that self-esteem-related interventions have a small but significant effect in reducing suicidal ideation at post intervention and 3-month follow-up.

The effect size for suicidal ideation [$g = -0.24$, 95% CI $(-0.48, 0.00)$] at post-intervention from the current analysis was compared with similar meta-analysis involving other types of interventions. The results suggest that self-esteem-related interventions could be more effective than self-guided digital interventions [$g = -0.18$, 95% CI $(-0.27, -0.10)$] (Torok et al., 2020), as effective as face-to-face CBT [$g = -0.24$, 95% CI $(-0.41, -0.07)$] (Leavey and Hawkins, 2017), but less effective than dialectical behavior therapy [$g = -0.31$, 95% CI $(-0.52, -0.09)$] (Kossgassner et al., 2021) in reducing suicidal ideation post intervention.

The results revealed that the included studies used diverse intervention methods. Treatment ranged from CBT to writing intervention, with only three studies (Hooley et al., 2018; Clore and Gaynor, 2006; Pachankis et al., 2020) using interventions focused specifically on enhancing self-esteem. Additionally, different therapies have different approaches to self-esteem enhancement. For example, it is suggested that CBT can enhance self-esteem by encouraging individuals to become aware of their own negative predictions and self-critical thoughts, and then reconstruct their negative self-image by challenging and testing the predictions and thoughts (Fennell, 2016). For writing interventions, it is believed that writing helps in organizing and altering the way an event is presented in memory, allowing individuals to recall more dimensions of the event and thus helping them have a more objective view of themselves (Esterling et al., 1999). In evaluative conditioning, the way an individual views themselves is restructured by repeatedly pairing words that represent the self (i.e., I or me) with positively valenced stimuli (i.e., positive words or images) (Franklin et al., 2016; Dijksterhuis, 2004).

It has been suggested that enhancing self-esteem is effective in the prevention of suicide, as high self-esteem could buffer the negative effects of many psychological risk factors for suicide (Soto-Sanz et al., 2019). Specifically, self-esteem has been shown to be a protective factor against several suicide risk factors, namely depression (Eisenbarth, 2012; Rossi et al., 2020), anxiety (Rossi et al., 2020; Greenberg et al., 1992), loneliness (Rossi et al., 2020), and hopelessness (Chioqueta and Stiles, 2007). Thus, it is possible that when an intervention incorporates or focuses exclusively on self-esteem enhancement, the heightened sense of self-esteem could buffer against the negative impact of risk factors for suicide. The interpersonal theory of suicide offers another possible explanation for how increasing self-esteem might lead to a decrease in suicidal behaviors (Van Orden et al., 2010). The theory posits that suicidal desire results from the co-occurrence of thwarted belongingness (i.e., feelings that one is disconnected from others) and perceived burdensomeness (i.e., feelings that one is a burden on others). As self-hate is an indicator of perceived burdensomeness, it is likely that increasing self-esteem helps to alleviate the feelings of being a burden on others and lead to a reduction in suicidal behaviors.

A somewhat surprising finding from the current review is that the effect size for suicidal ideation at the 3-month follow-up was higher than at post-intervention. This result demonstrates that the effect on suicidal ideation caused by self-esteem-related interventions could be maintained even at follow-up. A possible explanation for this result is that the main goal of self-esteem programs is targeting and modifying self-critical thinking (Laithwaite et al., 2007). Since self-critical thinking has been shown to play an important role in the development and maintenance of psychopathology, it is likely that a program with self-esteem component could lead to long-term maintenance of reduction in suicidal ideation (Laithwaite et al., 2007; Gilberts, 2005).

4.1. Limitations

Although these results show a potential for self-esteem-related interventions in reducing suicide, they should be interpreted with caution due to several limitations. The numbers of included papers in this meta-analysis were small with a small sample size and varied sample population, which could lead to a high risk of bias. Different suicidal outcomes and follow-up periods also made it difficult to calculate the pooled effect size. Further, unlike previous studies (Haney and Durlak, 1998; Niveau, New and Beaudoin, 2021; O'Mara et al., 2006), the current systematic review and meta-analysis limited the definition of self-esteem intervention to only those studies that incorporate self-esteem as one of the treatment components. However, it must be noted that most of the studies included in the review not only include self-esteem enhancement but also other treatment modules. This makes it difficult to isolate self-esteem as the cause of reduction in suicidal behaviors. Nevertheless, we used broad inclusion criteria because, so far, there are few interventions that focus specifically on enhancing self-esteem. Furthermore, the Cochrane guidelines for the systematic review of intervention studies also suggest that reviews with broad inclusion criteria are feasible and encouraged because the results could provide clues regarding whether an intervention operates differently in certain conditions (in this case, whether self-esteem-related intervention is effective in reducing suicide) (Higgins et al., 2019). Some of the included studies involve high risk of bias in certain domains, especially in blinding of outcome and incomplete outcome data. Lastly, the current review and meta-analysis was unable to control for potential confounding factors, including age and follow-up periods. While trajectory of self-esteem has been shown to change over time (Mann et al., 2004), we were unable to separate data between the adolescent group and the adult group in the current review due to the small number of studies. Similarly, given the enduring nature of suicide (Van Orden et al., 2010), studies with longer follow-up periods are needed to confirm these results. Thus, our conclusion must be interpreted with caution because of methodological limitations of analyses.

4.2.Implications for Practice

While self-esteem has been demonstrated to play a crucial role in mental health and well-being, self-esteem-based interventions remain nascent. As high self-esteem could protect against suicidality, it is possible that interventions for suicide may improve treatment efficacy by focusing exclusively on enhancing self-esteem or at least incorporate self-esteem enhancement as part of their treatment targets. Furthermore, while some self-esteem interventions or related psychological models currently exist (e.g., the intervention program “Everybody's Different”; the CBT model for low self-esteem) (Fennell, 1997; O’Dea, 1995), current evidence for these types of interventions is limited. Thus, new interventions that focus specifically on self-esteem or are established on self-esteem theory should be developed and evaluated. Additionally, as self-esteem has been suggested to be susceptible to change during young age (Haney and Durklak, 1998; Orth and Robins, 2014), it is possible that integrating self-esteem improvement into school curriculum may help to prevent future suicidal behaviors.

5. CHAPTER CONCLUSION

In summary, Chapter I conducted the first systematic review and meta-analysis on the effects of self-esteem-related interventions in reducing suicidal behaviors. The findings suggest that self-esteem-related interventions are effective in reducing suicidal ideation at post intervention and 3-month follow-up. However, due to the broad inclusion criteria and limited number of studies, these results should be interpreted with caution. Moderators such as intervention length, delivery method, and the contents of intervention should be investigated in future review. Finally, future studies should also assess the long-term benefits and mechanisms of change for each type of intervention. The findings in this chapter strongly suggest that incorporating self-esteem enhancement into the psychoeducation program for Chapter III is necessary to reduce suicidal behaviors. Furthermore, results from this chapter indicate that self-esteem can be effectively targeted using techniques from CBT.

CHAPTER II: RELATIONSHIP BETWEEN SELF-ESTEEM AND SUICIDAL IDEATION BEFORE AND DURING COVID-19 IN A NON-CLINICAL SAMPLE: MEDIATING EFFECTS OF PSYCHOLOGICAL DISTRESS AND HOPELESSNESS

1. INTRODUCTION

1.1.The Corona-pandemic and its effect on mental health

The coronavirus disease (COVID-19) pandemic has led to a surge in mental health issues worldwide (Wang, Xu and Volkow, 2021). Mental health conditions, such as anxiety, depression, or even posttraumatic stress disorder, do not only affect patients with COVID-19 but also emerge from the general population (Leung et al., 2022). Moreover, the psychological aftereffects of the pandemic are likely to last for months or perhaps years (Kathirve, 2020). One of the most serious mental issues that have increased due to COVID-19 is suicidal behaviors. Compared with the pre-COVID-19 era, significant increases in incident rates for suicidal thoughts (10.81%) and suicide attempts (4.68%) were observed during the pandemic (Dube et al., 2021). Furthermore, a moderate prevalence of suicidal ideation among university students was also reported in the midst of COVID-19 (Kaggwa et al., 2022; Zhou et al., 2021). In Japan, despite experiencing a downward trend before the pandemic (2011–2018), the suicide rates of students continuously increased during the pandemic period (Ministry of Health, Labour and Welfare, 2022). These results suggested that additional studies on suicide among university students during COVID-19 should be conducted.

The link between COVID-19 and increased suicide risk is a result of complex societal and psychological changes due to the pandemic. Research demonstrates that the negative effects of COVID-19, such as financial instability, feelings of uncertainty, or reduced social support, would create pandemic-related stress. Psychological responses to pandemic-related stress would then lead to an increase in suicidal ideation (Hwang et al., 2022).

1.2.The Escape Theory of Suicide and Suicidal Ideation During COVID-19

The escape theory of suicide (Baumeister, 1990) mentioned in the Literature Review provides a framework for understanding the development of suicidal ideation, especially during the current pandemic. According to the theory, an individual must undergo a six-step process for suicide to emerge. (a) First, they must fail to meet standards due to high expectations or recent setbacks or both. (b) In the next step, the individual then attempts to use self-blame strategies to make sense of perceived failures. (c) An aversive state of self-awareness emerges in the third step due to these self-blaming behaviors. (d) Negative emotions, especially depression, and anxiety, also begin to surface following the increase in negative self-awareness. (e) The person then responds to these unfavorable emotions by attempting to escape from meaningful thoughts into a numb state of cognitive deconstruction. (f) Finally, suicidal ideation manifests as an extension of the desire of the person to escape from the self.

The reason why the thesis's author believe the escape theory of suicide is particularly applicable to the settings of the COVID-19 outbreak is because COVID-19 has created significant changes and setbacks for countries around the world, which is similar to the conditions mentioned in the first step of the theory. Specifically, the COVID-19 pandemic has led to unfavorable societal changes, such as inflicting damage to local economies, instilling fear of contagion in the minds of the people and creating disruptions in daily relationships (Hwang et al., 2022), which have been linked to an increase in suicidal ideation. According to the first step of escape theory, recent or current adverse conditions that indicate a significant decline from earlier conditions would lead to suicide. As specified by Baumeister (1990), examples of adverse conditions are economic downturn, failing health, or deterioration of relationships, which are consistent with those of Hwang et al. (2022) on societal changes during the COVID-19 crisis that were linked with suicide. Consequently, the current thesis hypothesizes that the COVID-19 crisis has created substantial setbacks for every country and its population, which caused an increase in suicidal behaviors.

The second and third steps of the theory emphasized how self-blame and negative self-awareness characterize suicidal individuals. These steps could be represented by low self-esteem. Particularly, low self-esteem was linked to a high tendency toward self-blaming behaviors (Kresznerits, Rozsa and Perczel-Forintos, 2022; Moroz and Dunkley, 2015). In addition, studies reported that individuals with low self-esteem were significantly more self-conscious about negative emotions than those with high self-esteem (Kim et al., 2019). Regarding the relationship between self-esteem and suicidality, this relationship has been stated extensively in the Literature Review and Chapter I. For example, the results of a cross-national comparison study (Chatard, Selimbegović and Konan, 2009) indicated that countries with people with relatively low levels of self-esteem are more likely to have higher suicide rates regardless of other social factors. Furthermore, enhancing self-esteem, especially among adolescents and young adults, is considered an effective strategy for reducing suicidal behaviors (Bos et al., 2006; Dat et al., 2022). Accordingly, to create an effective self-esteem intervention program for reducing suicidal behaviors, additional studies on the role of self-esteem and its underlying mechanism in the development of suicide are highly needed. The current study hypothesized that self-esteem is a predictor of suicidal ideation.

The fourth stage of the theory proposes that negative emotions, emerge due to negative self-awareness. Due to previous stages of the theory, the individual now views themselves as inadequate, and thus negative feelings, especially anxiety and depression, arise (Baumeister, 1990). This stage could be measured by psychological distress, which is an emotional state characterized by anxiety and depression symptoms (Viertio et al., 2021). Additionally, high levels of psychological distress indicate a potential diagnosis of depressive and anxiety disorders (Viertio et al., 2021). Psychological distress is also associated with an increased risk of suicide, particularly in the midst of the COVID-19 pandemic (Manzar et al., 2021; We et al., 2022). Finally, previous studies suggested that the concept of cognitive destruction in the fifth step is characterized by a feeling of hopelessness. Specifically, individuals with high hopelessness are indicated to only

focused on the present, short-term oriented, and have a concrete focus on immediate actions, which is similar to the state of cognitive deconstruction (Dean and Range, 1999; Van et al., 2022). Hopelessness is represented by the assumption that bad things will happen and that good things will not happen together with the conviction that nothing can be done to improve the situation (Tao et al., 2023). With regard to the relationship between hopelessness and suicide, prior studies indicate that hopelessness is a strong predictor of suicidal behaviors, even in Japanese sample (Sueki, 2022; Ribeiro et al., 2018). Hopelessness is also believed to be a better predictor of suicide behaviors than depression, and thus is an important component of the fifth step of escape theory (Dean and Range, 1999). Hence, the current study examines psychological distress and hopelessness as serial mediators in the relationship between self-esteem and suicidal ideation.

1.3.Establishing Evidence for Clinical Trials through Mediation Analysis

A mediator is defined as a variable that explains the mechanism by which an independent variable influences a dependent variable (Frazier,Tix and Barron, 2004). It has been indicated that mediation analysis results offer unique insights for intervention program design by pinpointing factors that mediate the observed effects, thus highlighting the most promising targets for intervention (MacKinnon, Fairchild and Fritz, 2007). While the association between low self-esteem and suicidal ideation is well-established (e.g., Soto-Sanz et al., 2019), the precise mechanisms through which self-esteem influences suicidal thoughts remain unclear. Additionally, unlike self-compassion interventions (which will be discussed in Chapter III), there are numerous interventions for enhancing self-esteem, coupled with the differences in treatment models, measurements, and methodologies across studies, hinders researchers from pinpointing the most effective approach to target specific mental health issues such as suicidal behaviors (Niveau, New and Beaudoin, 2021). Therefore, mediation analysis is essential to investigate the underlying mechanisms by which self-esteem interventions

might work in reducing suicidal behaviors, ultimately guiding the development of more targeted and impactful programs.

1.4. Purpose of the current chapter

Based on the abovementioned literature review, the present study aimed to explore the relationship among self-esteem, hopelessness, psychological distress, and suicidal ideation. Furthermore, within the framework of the escape theory of suicide, this chapter investigated a serial mediation model with self-esteem as the independent variable, hopelessness and psychological distress as the serial mediators, and suicidal ideation as the dependent variable. It is hypothesized that psychological distress and hopelessness would serially mediate the relationship between self-esteem and suicide. Finally, the present chapter further explored whether or not a significant difference exists between the pre-pandemic and the pandemic mediation model.

2. METHODS

2.1. Participants

The initial sample consisted of data from 932 participants who were students that visited the Hokkaido University Health Care Center, Japan before and throughout the COVID-19 pandemic. Specifically, data were collected during the academic year (from April to March), from 536 students before the pandemic (2018–2019) and from 396 students during the pandemic (2020–2021). Data was collected from students who had visited the university health care center during this period to receive psychiatric consultation. The current study only utilized non-clinical data, because scholars suggest that the presence of any mental disorder is a major risk factor for suicide (Gili et al., 2019), which makes determining the relationship between the study variables difficult. Furthermore, one study reported that data collected from the Hokkaido University Health Care Center may lead to bias toward a clinical sample (Dat et al., 2021). Thus, to ensure the non-clinical status of the current sample, the study conducted an initial

screening evaluation using the Mini International Neuropsychiatric Interview (MINI) Screen (version 5) and a clinician's diagnosis to exclude participants suspected of having major psychiatric disorders (Engman et al., 2018). The MINI Screen is a self-rated scale that consists of 16 modules, in which each refers to a diagnosis of a major psychiatric disorder (Sheehan et al., 1998). As suicidal ideation is the dependent variable, the current study did not use the suicide module. After excluding data by comparing the results of the MINI Screen and the diagnosis of the clinician, the final sample comprised data from 645 participants, among which 291 (45.1%) were collected during the pandemic. The participants were all Japanese, and no missing data points were observed.

2.2. Ethical considerations

Data were collected as part of routine medical examinations; such that consent forms were not obtained. However, the participants were given the option to decline participation by opting out of having their information used. The opt-out process was modified in accordance with the steps listed on the website of the Hokkaido University Health Care Center (information is presented in Japanese). No students apply to have their data opt out from the study. The ethical committee of the Graduate School of Medicine in Hokkaido University approved the study, which was conducted according to the ethical guidelines outlined by the Helsinki Declaration in 1964 (amended in Fortaleza on October 2013).

2.3. Measures

2.3.1. Self-esteem

The study used the Rosenberg Self-Esteem Scale (RSES) to measure the self-esteem of the participants (Rosenberg, 1965b). The RSES consists of 10 items (e.g., I feel that I have a number of good qualities), which are rated using a four-point Likert-type scale. The study used the Japanese version of the scale, which was adapted by

Mimura and Griffiths (2007). For the current sample, the data demonstrated very good reliability (Cronbach's $\alpha = 0.85$).

2.3.2. Psychological distress

The Kessler Psychological Distress Scale (K10) was used to assess psychological distress (Kessler et al., 2003). The K10 is a 10-item scale (e.g., During the last 30 days, about how often did you feel worthless?) that assesses non-specific anxiety and depressive symptoms of the past 4 weeks. The Japanese version of the scale exhibited good reliability and validity (Furukawa et al., 2008). In the current study, the internal consistency of the scale was 0.89, which indicates good reliability.

2.3.3. Hopelessness

The study employed the Beck Hopelessness Scale (BHS) to assess feelings of hopelessness (Beck et al., 1974). The BHS is a 20-item scale that assesses future hopelessness using true or false statements such as "I" The Japanese adaptation of the scale by Tanaka et al. (1996) was used, which displayed a high internal consistency for the current sample (0.84).

2.3.4. Suicidal ideation

Suicidal ideation was assessed using the ninth item of the Patient Health Questionnaire (PHQ-9), which asks about "*thoughts that you would be better off dead or hurting yourself in some way*" (Spitzer, Kroenke and Williams, 1999). Scholars suggested that the ninth item is effective in screening for suicidal ideation or suicide attempt (Penfold et al., 2021; Walker et al., 2010). The Japanese adaptation of the item was used (Muramatsu et al., 2007), and the PHQ-9 displayed an acceptable Cronbach's α (0.83) for the present sample.

2.4. Data analysis

First, the study used the measures of skewness and kurtosis to check for normality of data with skewness between $[-3, 3]$ and kurtosis between $[-10, 10]$, which were considered acceptable (Kline, 2015). To determine whether or not a significant difference exists between the groups of participants tested before and during the COVID-19 outbreak, the study used chi-square and t-test. Two-tailed Pearson's correlation was then performed to explore relationships between the study variables. Data were analyzed using JMP Pro 16.

Path analysis was conducted in AMOS 25 to test the mediation model. In the model, self-esteem was the independent variable, psychological distress and hopelessness were the serial mediator variables, and suicidal ideation was the dependent variable. Standardized path coefficients (β) were reported. The model was just identified (0 degree of freedom), such that model fit could not be accessed. Thus, the study followed the recommendation of MacKinnon (2012) to examine the mediation effect, which requires meeting three conditions, namely, a significant association between the independent and dependent variables, a significant association between the mediators and the dependent variable while controlling for the independent variable, and a significant coefficient for the indirect path between the independent and dependent variables via the mediators. The significance of the direct and indirect effects was tested using a bias-corrected bootstrap procedure with 2,000 bootstrap samples. The direct and indirect effects can be considered significant if the 95% bootstrap confidence intervals (CI) do not include zero (Kline, 2015).

Finally, to determine if the mediation effects are different before and during the pandemic, the study conducted multi-group analysis using AMOS. First, the study estimated an unconstrained model (i.e., a model in which the structural parameter coefficients were freely estimated across the pre-pandemic and pandemic groups) and a constrained model (i.e., a model in which the structural parameters are equally

constrained across the pre-pandemic and pandemic groups). The chi-square difference test was used to assess differences between groups in which a significant p-value would indicate statistically significant differences between the pre-pandemic and pandemic models. The critical ratios of the differences in parameters were further conducted using AMOS to determine which specific paths in the models are significantly different. If z-values are larger than 1.96, then the pre-pandemic and pandemic mediation models are suggested to significantly differ in that path. Additionally, the bootstrapping analysis with 2,000 bootstrap samples was used to determine the significance of the indirect effects of each model (Byrne, 2010).

3. RESULTS

3.1. Preliminary analyses

Table 3 reports the demographic information of the respondents. No variable surpassed the skewness and kurtosis values of ± 2 , which indicates that data were normally distributed (Kline, 2015). Between-group comparisons demonstrated that no significant differences exist between data collected before and during the pandemic in terms of age, self-esteem, and hopelessness. However, the pre-pandemic group displayed significantly lower levels of psychological distress and suicidal ideation than did the pandemic group. Additionally, the gender ratio between the pre-pandemic and pandemic groups was significantly different.

Table 3. Characteristics of the study participants

Variable (Mean/SD)	Total (N = 645)	Pre-pandemic (N = 354)	Pandemic (N =291)	t-test. chi- square test	p-Value
Gender (Male/Female)	414/231	242/112	172/119	5.95	0.015*
Age	21.78(2.72)	21.83(2.80)	21.73(2.62)	0.49	0.622
RSES	21.87(5.01)	22.03(0.27)	21.68(0.29)	0.88	0.377
K10	15.49(8.73)	14.75(0.46)	16.38(0.51)	-2.35	0.018*
BHS	11.55(4.20)	11.46(0.22)	11.67(0.25)	-0.61	0.536
PHQ-9 Item 9	0.69(0.93)	0.60(0.83)	0.80(1.03)	-2.65	0.008**

Note. RSES = self-esteem; K10 = psychological distress; BHS = hopelessness; PHQ-9 Item 9 = suicidal ideation. * $p < .05$, ** $p < .01$

Correlation analysis (Table 4) illustrated that age and gender were not significantly correlated with the other study variables. As expected, self-esteem was significantly and negatively correlated with hopelessness, psychological distress, and suicidal ideation. Additionally, the results revealed that psychological distress had a significant positive correlation with hopelessness as well as suicidal ideation. Finally, hopelessness also exhibited a significant and positive correlation with suicidal ideation.

Table 4. Correlation between variables

Variables	Gender	Age	RSES	K10	BHS
Gender					
Age	0.04				
RSES	0.06	0.05			
K10	-0.05	-0.07	-0.53***		
BHS	0.02	-0.07	-0.65***	0.47***	
PHQ-9 Item 9	-0.07	-0.08	-0.39***	0.47***	0.39***

Note. RSES = self-esteem; K10 = psychological distress; BHS = hopelessness; PHQ-9 Item 9 = suicidal ideation. *** $p < .001$

3.2. Mediation analysis

In a model that includes only the direct path from self-esteem to suicidal ideation, self-esteem significantly predicted suicidal ideation ($\beta = -0.39$, 95% CI: -0.44 to -0.34 , $p < 0.001$). This model explained 16% of variance in suicidal ideation.

In a model containing the two mediators, the results illustrated that self-esteem continue to be significantly and negatively associated with suicidal ideation ($\beta = -0.12$, 95% CI: -0.21 to -0.03 , $p = 0.008$). In addition, psychological distress and hopelessness were significantly and positively related with suicidal ideation ($\beta = 0.33$, 95% CI: -0.24 to -0.40 , $p < 0.001$; $\beta = 0.16$, 95% CI: 0.07 to 0.25 , $p = 0.002$, respectively). Finally, the paths from self-esteem to psychological distress ($\beta = -0.53$, 95% CI: -0.58 to -0.46 , $p < 0.001$), from self-esteem to hopelessness ($\beta = -0.55$, 95% CI: -0.61 to -0.48 , $p < 0.001$), and from psychological distress to hopelessness ($\beta = 0.18$, 95% CI: -0.10 to 0.25 , $p < 0.001$) were significant (Figure 5). The total indirect effect of self-esteem on suicidal ideation (Table 5) was significant ($\beta = -0.27$, 95% CI: -0.35 to -0.21 , $p < 0.001$). The model explained 26% of variance in suicidal ideation. Accordingly, the serial mediation model was supported.

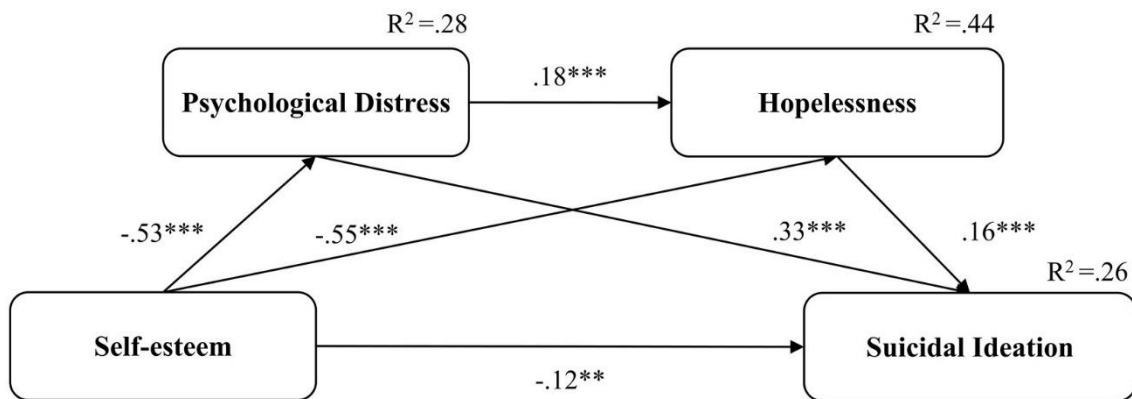


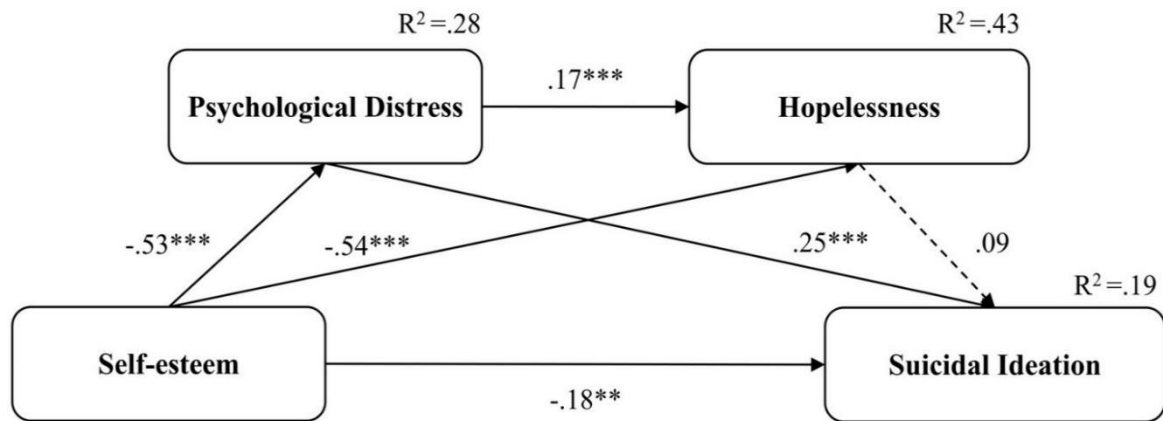
Figure 5. Serial mediation model for the full sample with standardized coefficients.

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

3.3. Multi-group analysis

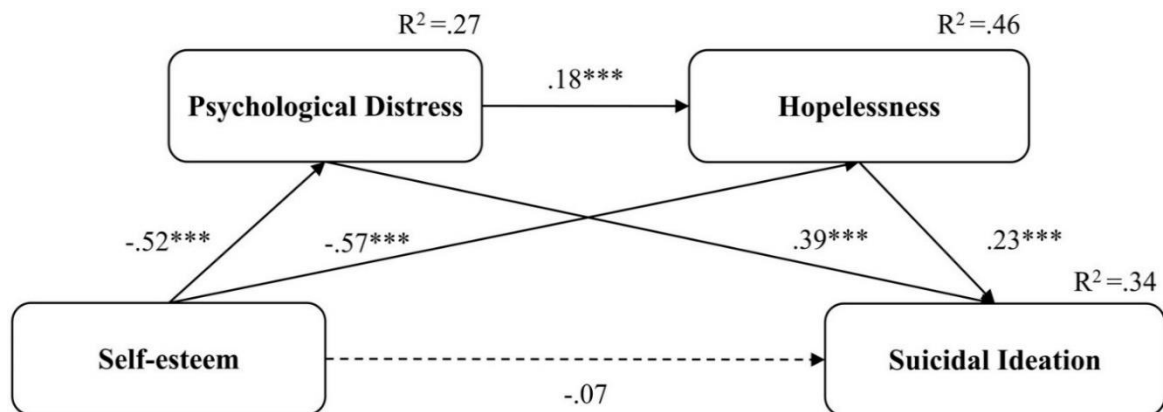
To examine whether the serial mediating effect of psychological distress and hopelessness in the relationship between self-esteem and suicidal ideation is consistent between the pre-pandemic and pandemic groups, the study conducted multi-group analysis. The results from chi-square difference test demonstrated that the differences between the constrained and unconstrained models were significant [χ^2 diff (6) = 16.09, $p = 0.01$], which indicates that statistically significant differences exist between the pre-pandemic and pandemic models.

In the pre-pandemic model, the model (Figure 6) explained 19% of variance in suicidal ideation. The study observed a significant direct effect ($\beta = -0.18$, 95% CI: -0.30 to -0.04 , $p = 0.009$) and a significant total indirect effect ($\beta = -0.19$, 95% CI: -0.28 to -0.10 , $p < 0.001$) of self-esteem on suicidal ideation. The pandemic model (Figure 7) explained 34% of variance in suicidal ideation. The study noted a non-significant direct effect ($\beta = -0.07$, 95% CI: -0.20 to 0.07 , $p = 0.322$) and a significant total indirect effect ($\beta = -0.35$, 95% CI: -0.45 to -0.26 , $p < 0.001$) of self-esteem on suicidal ideation. Table 5 presents the specific direct and total indirect effects for all models. Additionally, the non-significant direct effect of the pandemic model indicated that psychological distress and hopelessness fully mediated the relationship between self-esteem and suicidal ideation during the pandemic.



Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Dotted lines represent non-significant coefficients; solid lines represent significant coefficients.

Figure 6. The pre-pandemic serial mediation model with standardized coefficients.



Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Dotted lines represent non-significant coefficients; solid lines represent significant coefficients.

Figure 7. The pandemic serial mediation model with standardized coefficients.

The critical ratios of differences in parameters were further examined to determine which pathway coefficients were significantly different between the two models (Byrne, 2010). The results demonstrated that the pathway from psychological distress to suicidal ideation was significantly weaker for the pre-pandemic sample ($Z = -2.374$, $\beta = 0.25$, $p < 0.001$) than that for the pandemic group ($\beta = 0.39$, $p < 0.001$).

Table 5. Bootstrapping results for the standardized direct and indirect effects

Model pathways	Point estimates	95% CI		p-Value
		Lower	Upper	
Full sample model				
Direct effects				
RSES → PHQ-9 Item 9	−.12	−.21	−.03	.008
RSES → BHS	−.55	−.61	−.48	.001
RSES → K10	−.53	−.58	−.46	.001
K10 → BHS	.18	.10	.25	.001
K10 → PHQ-9 Item 9	.33	.24	.40	.001
BHS → PHQ-9 Item 9	.16	.07	.25	.002
Total indirect effect from RSES → PHQ-9	−.27	−.35	−.21	.001
Item 9				
Pre-pandemic model				
Direct effects				
RSES → PHQ-9 Item 9	−.18	−.30	−.04	.009
RSES → BHS	−.54	−.63	−.45	.001
RSES → K10	−.53	−.60	−.44	.001
K10 → BHS	.17	.08	.27	.002
K10 → PHQ-9 Item 9	.25	.13	.36	.001
BHS → PHQ-9 Item 9	.09	−.03	.22	.158
Total indirect effect from RSES → PHQ-9	−.19	−.28	−.10	.001
Item 9				
Pandemic model				
Direct effects				
RSES → PHQ-9 Item 9	−.07	−.20	.07	.322
RSES → BHS	−.57	−.65	−.48	.001
RSES → K10	−.52	−.59	−.42	.002
K10 → BHS	.18	.08	.28	.001
K10 → PHQ-9 Item 9	.39	.28	.49	.001
BHS → PHQ-9 Item 9	.23	.10	.35	.001
Total indirect effect from RSES → PHQ-9	−.35	−.45	−.26	.001
Item 9				

Note. RSES = self-esteem; K10 = psychological distress; BHS = hopelessness; PHQ-9 Item 9 = suicidal ideation.

4. DISCUSSION

The current study investigated the relationship among self-esteem, psychological distress, hopelessness, and suicidal ideation. Specifically, it aimed to explore the serial mediation effect of psychological distress and hopelessness on the relationship between self-esteem and suicidal ideation. Furthermore, we examined whether or not the mediation effect was significantly different between data collected before and during the pandemic.

In line with previous studies (Breslau et al., 2021; Patel et al., 2022), the current findings depicted a significant increase in psychological distress during the COVID-19 pandemic. Furthermore, the results indicated that suicidal ideation was greatly increased during this crisis. Previous scholars observed that compared to before the pandemic, suicidal ideation underwent a sharp increase in the midst of the pandemic in many countries (Sara et al., 2022; Liu et al., 2022; Sasaki et al., 2022). Apart from suicidal ideation, suicide death, suicide attempt, and self-harm, also significantly changed during COVID-19 (Kurita, Sugawara, Ohkusa, 2022; Wan Mohd Yunus et al., 2022). Notably, however, the current result is in contrast with that of a previous study in Japan (Otsuka, Fujiwara and Takano, 2023), which illustrated that university students experienced significantly low levels of suicidal ideation during than before COVID-19. This difference could be due to the difference in the target samples between the two studies. Ewing et al. (2022) have suggested that university students without major mental health problems could experience more difficulty when addressing COVID-19-related stress and negative emotions than do students with mental health problems. Accordingly, the difference in suicidal ideation could be due to the focus of the current study, which is only on a non-clinical sample, while Otsuka et al. (2023) focused on students who visited the school counseling service (which may be biased more toward a clinical sample).

Regarding the relationship between self-esteem and suicidal ideation, the current study found that self-esteem is directly and negatively associated with suicidal ideation, which is consistent with the results of previous studies (de la Barrera et al., 2022; Primananda and Keliat, 2019). The relationship between self-esteem and suicidal behaviors has been well established and examined in many suicide theories. For example, the interpersonal theory of suicide states that low self-esteem is related to perceived burdensomeness, which, together with thwarted belongingness, could lead to the emergence of a suicidal desire (Van Orden et al., 2010). Furthermore, stage three of escape theory posits that recent low self-esteem due to failure or setback may lead to suicide. Escape theory also differentiates between suicidal and non-suicidal individuals with low self-esteem. It mentions that although non-suicidal people tend to hold critical views of themselves and others, suicidal people tend to hold favorable views of others while maintaining critical perceptions of the self (Baumeister, 1990).

Moreover, the results of path analysis revealed that psychological distress and hopelessness serially mediated the associations between self-esteem and suicidal ideation. The result suggested that individuals with low self-esteem experienced high psychological distress, which further lead to feelings of hopelessness and, eventually, to the development of suicidal ideation. Separate studies demonstrated that hopelessness ((Zhang et al., 2017) and psychological distress (Puukari et al., 2018) were mediators between self-esteem and suicidal ideation. Additionally, Wang et al. (2021) conducted a study on medical students in China and reported that hopelessness and psychological distress serially mediated the relationship between psychological strains and suicidal behaviors. However, this study is the first to investigate the serial mediation roles of psychological distress and hopelessness in the relationship between self-esteem and suicidal ideation. The current results could be explained based on escape theory. According to the theory, failure and setback would lead to negative self-attribution and self-awareness, which are characterized by low self-esteem in the current model. A person with negative self-views would then develop negative emotions and try to escape

into a numb state of cognitive deconstruction. In the mediation model of the present study, these stages were represented by psychological distress and hopelessness. Finally, this sequential chain of events would drive an individual to commit suicide (Baumeister, 1990).

The result of multi-group analysis pointed to a significant difference between the pre-pandemic and pandemic mediation models, which indicates that the serial mediation effect is stronger for data collected during than before the pandemic. This finding is consistent with the first step of escape theory, which posits that significant recent or current setbacks, such as economic instability, health threat, and disturbance in close relationships, would precede suicide (Baumeister, 1990). The public frequently experienced such events during the COVID-19 pandemic (Hwang et al., 2022). Thus, an interpretation of the result is that the presence of the pandemic could strengthen the pathways of the mediation model, and living through the COVID-19 pandemic may increase the risk of suicide.

Unexpectedly, the results indicate that the link between psychological distress and suicidal ideation in the mediation model was significantly weaker pre-pandemic in comparison with data collected during the pandemic, which warrants further investigation. A possible explanation is that stressors related to COVID-19, such as self-isolation, lack of social support, and economic uncertainty (Raj et al., 2020), have strengthened the relationship between the two variables. Previous studies reported that pandemic-related stress could lead to a significant increase in depression, anxiety, and stress (Chan, Piehler and Ho; Yoshioka et al., 2021). Similarly, an increase in suicide death was linked to the fear of COVID-19 (Mamun and Griffiths, 2020; Dsouza et al., 2020). The results of the current study also revealed that psychological distress and suicidal ideation for the pandemic group were significantly higher than those of the pre-pandemic group, which partially supports this explanation. Furthermore, a recent study suggested that non-clinical university students may experience more difficulty in

addressing COVID-19-related stress and negative emotions than students with mental health problems (Ewing et al., 2022). The present study conducted analysis using a cohort of non-clinical university students; thus, a possibility existed that the current sample was more affected by stress and negative emotions related to the pandemic, which led to the stronger relationship between psychological distress and suicidal ideation. Hence, the emergence of pandemic-related stressors and the use of data from a non-clinical sample may be the explanation for the strengthened link between psychological distress and suicidal ideation in the pandemic group compared with the pre-pandemic sample. However, additional research is required to put forward a more concrete explanation regarding this difference.

4.1. Limitations

The current study has several limitations that need to be addressed. First, the cross-sectional design makes determining the causation of factors challenging. Thus, future studies should implement a longitudinal design to precisely determine the link among self-esteem, psychological distress, hopelessness, and suicidal ideation. Second, the study used self-reported measures for obtaining data for the study variables, which could lead to respondent or information bias. Thus, we recommend that prospective studies should collect data using a structured interview design. Another limitation is related to the use of the ninth item of the PHQ-9 to measure suicidal ideation, which may raise certain concerns regarding the reliability of the results. Nevertheless, two aspects are worth mentioning: currently, the scales for measuring suicidal ideation or suicidal behaviors (e.g., the Columbia Suicide Severity Rating Scale or the Beck Scale for Suicide Ideation) has yet been validated or adapted to Japanese versions. Second, previous studies suggested that the ninth item of the PHQ-9 is effective in screening for suicidal ideation (Penfold et al., 2021; Walker et al., 2010). Finally, there was a significant difference in gender distribution between the pre-pandemic and the pandemic sample, which could influence the results.

4.2. Clinical implications

Although self-esteem enhancement has been suggested to reduce suicidal behaviors (Bos et al., 2006; Dat et al., 2022), the underlying mechanism of the change in this relationship remains unclear. Study further suggests that self-esteem interventions would be more successful when its contents are theory- and evidence-based and cater to the unique requirements of different target groups (Bos et al., 2006). Thus, to create an effective self-esteem intervention program for reducing suicidal ideation, studies on the mediators and mechanisms of the change in the relationship between self-esteem and suicidal ideation are much needed.

Furthermore, self-esteem interventions have also shown promising results among university students. Recent studies suggest that self-esteem-based interventions could be effective in improving self-acceptance (Qia, Yu and Xiu, 2022), academic achievement (Pervee, Hamzah and Ramlee, 2020), or reducing eating disorder behaviors (Forbush et al., 2023) in samples of undergraduate students. These studies target self-esteem by various methods, ranging from teaching cognitive behavior therapy (CBT) or mindfulness techniques, to psychoeducation about topic such as self-understanding or body images (Qia, Yu and Xiu, 2022; Pervee, Hamzah and Ramlee, 2020; Forbush et al., 2023). However, as far as we know, currently there is no study investigate the effect of self-esteem-intervention in reducing suicidal behaviors among university students. The current results indicate that hopelessness and psychological distress are the underlying mechanism through which self-esteem affects suicidal ideation. One proposed method for reducing psychological distress and hopelessness in order to improve self-esteem is through CBT. Indeed, CBT programs that specifically develop to target low self-esteem have also show to reduce anxiety and depression, which are two factors that closely related to psychological distress and hopelessness (Waite, McManus and Shafran, 2012). Additionally, targeting cognitive distortion through CBT's techniques have been indicated as an effective way to combat against psychological distress and hopelessness (Jager-Hyman et al., 2014; Stromeier et al., 2016).

Moreover, the results demonstrated that the relationship between variables were significantly different between data from before and during the pandemic, especially in the path from psychological distress to suicidal ideation. This result indicates that implementing a self-esteem intervention program that targets psychological distress and hopelessness is highly needed during the current COVID-19 crisis. In addition, this result may not only be limited to the present pandemic period but may also be relevant to future crisis scenarios. As previously mentioned, the first step of the escape theory of suicide states that major life events precede suicide behaviors, which can lead to fall short of expectations (Baumeister, 1990). As a result, the present study could also serve as reference in providing an explanation for the increase in suicide rates in future crisis situations.

Finally, while the current study tried to control for the influence of mental disorders by limiting the sample to only those without any mental disorders, other psychosocial factors such as personality traits or temperament, which was not evaluated in this study, could also affect the outcomes of suicidal behaviors (Brezo, Paris and Turecki, 2006; Karam et al., 2015). Accordingly, future studies should control for the presence of these factors when examining the impact of self-esteem, psychological distress, and hopelessness on suicidal behaviors.

5. CHAPTER CONCLUSION

In summary, the second chapter investigated the role of the escape theory in the pandemic as well as comparing the differences between the levels of self-esteem, psychological distress, hopelessness and suicidal ideation during the pre-pandemic and pandemic period. The present study found that low self-esteem is a risk factor for suicidal ideation, and psychological distress as well as hopelessness serially mediated this relationship. In addition, it found a significant difference between the pre-pandemic and pandemic models, specifically in the path from psychological distress to suicidal ideation. These findings highlight the importance of targeting self-esteem, psychological

distress, and hopelessness in treating individuals with suicidal ideation, especially during the ongoing pandemic or in future similar crises. Based on the findings from the present chapter, the psychoeducation content will be expanded to address feelings of hopelessness and psychological distress in order to effectively target suicidal risk in university students. Considering that CBT techniques targeting cognitive distortion have been shown to effectively reduce hopelessness and psychological distress (Jager-Hyman et al., 2014; Stromeier et al., 2016), Chapter III will devote one session of the psychoeducation program on cognitive distortion and coping strategies against cognitive distortion.

CHAPTER III: FEASIBILITY AND ACCEPTABILITY OF AN INTERVENTION THROUGH ENHANCEMENT OF SELF-ESTEEM AND SELF-COMPASSION IN UNIVERSITY STUDENTS AT RISK FOR SUICIDE

1. INTRODUCTION

1.1.The purpose of pilot studies in clinical research

A pilot study is defined in the dictionary of epidemiology as “*a small-scale test of the methods and procedures to be used on a larger scale.*” (Porta, 2008, p. 215). Pilot studies play a pivotal role in clinical research, serving as a preliminary investigation before conducting a randomized clinical trial. Their significance lies in several key aspects. Specifically, results from a pilot study can provide information regarding screening rate (i.e., number of screening can be conducted per month); recruitment rate (i.e., number of eligible participants per month); retention rate (i.e., the number of participants continue to participate in the study until the end period); randomization (i.e., feasible randomization method for the specific study design); treatment adherence rates (i.e., the number of participants adhere to protocol for each intervention); treatment fidelity (fidelity rates per unit monitored); and assessment process (i.e., completion rates of planned questionnaire and completion times of each assessment) (Leon, Davis and Kraemer, 2011). As a result, it is highly recommended to first conduct a pilot trial when investigate the efficacy of a novel intervention, novel applications of interventions, or when examine the efficacy of an old intervention in a new population or implementing a new delivery system.

The Soler et al. (2022) study highlights the importance of using pilot studies for creating an effective intervention development, especially with high-risk participants. Specifically, their initial 8-week program for borderline personality disorder (BPD) underwent two rounds of participant feedback, allowing researchers to refine the content. Problems like high drop-out rates (60% for the initial intervention and 40% for the

second intervention) or dissatisfaction with some contents of the program were raised. Practices with low effectiveness or negative impacts were removed, while valuable skills were emphasized. For instance, based on feedback, the researchers adjusted the program structure by removing the “regulating negative emotions” session and replacing it with self-compassion training. These modifications aimed to improve the participant experience and potentially reduce dropout rates in future interventions. Ultimately, the results from the final intervention program demonstrated improved retention rates (Dropout rates were reduced to 20%) and high satisfaction with all the content program from the participants.

In conclusion, pilot studies could help researchers create better treatment programs by optimizing program effectiveness and participant experience, ultimately leading to more robust interventions for larger trials. Considering that suicidal individuals are a high-risk sample, it is highly necessary to conduct a pilot study before conducting a large-scale intervention study in this sample.

1.2.The theoretical framework for the intervention program and rationale behind the decision

Research suggests that suicide prevention programs are most effective when informed by specific established theories of suicide (Hill et al, 2022). Accordingly, the current suicide intervention program is designed based on the Interpersonal Theory of Suicide (ITPS; Joiner, 2005; Van Orden et al., 2010), with a focus on enhancing self-esteem and self-compassion into each session. As mentioned in the Literature Reviews, the theory posits that the desire for suicide emerges from a combination of perceived burdensomeness (i.e., the belief that one’s life is a burden to loved ones and society) and thwarted belongingness (i.e., feeling a sense of social disconnection with others). The IPTS further suggests that suicidal ideation can progress to a suicide attempt when the individual identifies or acquires a capability for suicide (i.e., increased desensitization to the fear and pain associated with suicidal acts).

Among a wide array of theories for suicide, the ITPS was chosen as the foundation for the present intervention program due to several factors: First, the ITPS provides a particularly relevant theoretical framework for understanding and preventing suicide among university students. As mentioned earlier in the Literature review, the university environment can trigger feelings of isolation (thwarted belongingness) and burdensomeness due to academic pressures or social conflicts. Exposure to suicide methods online (capability for suicide) further intensifies risk in university students, especially those with low self-esteem and self-compassion.

Second, the ITPS is one of the suicide theories that is well-researched and supported by empirical evidence. For example, a 2017 meta-analysis of 122 studies (Chu et al., 2017) indicated that the combined effect of thwarted belongingness and perceived burdensomeness significantly predicted suicidal ideation, and all three dimensions of the ITPS could successfully predict suicide attempts.

Third, the concepts of self-compassion and self-esteem, which is the main focus of the current thesis, are also complementary and aligned with the ITPS framework. Specifically, low self-esteem is mentioned as an indicator of self-hate, which in turns is a dimension of perceived burdensomeness (Van Orden et al., 2010). While self-compassion was not mentioned explicitly in the theory, two of the negative aspects of self-compassion, namely self-criticism and isolation, are highly related to other facets of the ITPS. For example, self-criticism has been linked to self-hate (Werner et al., 2019), which contributes to feelings of perceived burdensomeness in the ITPS framework. Similarly, social isolation aligns with loneliness, a core component of thwarted belongingness (Van Orden et al., 2010). Additionally, a possibility exists that changing a negative self-image could help individuals address core interpersonal needs identified by the ITPS model: By fostering positive self-compassion and self-esteem, it would help at risk individuals recognize their worth, positive impact, and connection to others, which leads to a reduction in suicidal thoughts. Indeed, previous studies supported the

finding that self-esteem and self-compassion are significant protective factors against perceived burdensomeness and thwarted belongingness (Eades, Segal, and Coolidge, 2019; Umphrey, Sherblom, and Swiatkowski, 2021).

Fourth, unlike other suicide theories that focus on understanding the underlying psychological factors, the ITPS model prioritizes identifying and addressing risk factors. This emphasis on intervention makes it a strong foundation for an effective suicide prevention program. Specifically, Van Orden and colleagues state that “*According to the theory, interventions that directly or indirectly address perceived burdensomeness and thwarted belongingness should produce the best outcomes among suicidal individuals*” (Van Orden et al., 2010; p. 26). Interventions for suicidal behaviors could target the three core concepts of the ITPS theory by techniques such as involving skills training in communication and social connection or teaching cognitive reframing techniques to challenge negative self-beliefs (Bailey et al., 2018). Indeed, several intervention studies have yielded positive outcomes in developing suicide prevention programs grounded in the core principles of the ITPS model (e.g., Zullo et al., 2021; Short et al., 2019; Carrotte et al., 2021).

Finally, it is possible that the ITPS model is also particularly applicable to Asian countries, especially Japan. Specifically, the ITPS focuses on how the relationship between an individual and their social connections affect the development of suicide; it emphasizes a lack of belongingness and perceived burdensomeness as great risk factors for suicide. As described in the section “The cultural aspects of suicide in Japan” in the Literature Review, social values are emphasized in Japanese culture over individual values. The ITPS model aligns well with the importance of group harmony and fulfilling one’s roles within family and society in Japanese culture, where the individual needs come second to the needs of the social group (Wada, 2011). Moreover, shaming and social isolation are indicated to be the primary strategies used to maintain social cohesion in Japanese society (Russell, Metraux and Tohen, 2017). However, these

strategies can be risk factors for suicide as outlined in the ITPS model. Specifically, according to Van Orden et al (2010), feelings of shame contribute to perceived burdensomeness, and social isolation is a core component of thwarted belongingness.

In conclusion, the thesis's author believes that the ITPS is the ideal framework for creating the suicide intervention program. This model was chosen due to its direct applicability to university student sample; strong empirical evidence; alignment with the program's focus on self-compassion and self-esteem; emphasis on intervention strategies; and its relevance to Japanese culture. By building the program based on the ITPS model, along with incorporating promoting self-esteem and self-compassion, this program could have high efficacy in preventing among Japanese university students.

1.3.The protective effects of self-esteem and self-compassion on university student suicide prevention

As mentioned in the Literature review, suicide thoughts and behaviors are highly prevalent among college and university students (Crispim et al., 2021; Mortier et al., 2018). Specifically, the results of a meta-analysis indicated that approximately one out of four post-secondary students experience certain forms of suicidal ideation (Mortier et al., 2018). Furthermore, Eskin et al. (2016) conducted a study among university students in 12 countries and demonstrated that 29% and 7% of the sample reported suicidal ideation and attempt respectively, in which Japan is ranked among the countries with the highest prevalence rates of suicidal behavior. Additionally, despite the downward trend in previous years, the suicide rates of university students in Japan have continuously increased since 2019 (Ministry of Health, Labour and Welfare, 2022). Accordingly, studies on suicide prevention programs that target Japanese university students are much required.

A potential factor that could serve as a buffer against suicidal behavior among university students is positive self-image. Specifically, self-esteem, which is defined as a positive or negative view of oneself (Rosenberg, 1965a), has been linked with various

positive outcomes. Scholars propose that university students with high levels of self-esteem reported high levels of life satisfaction (Vilca-Pareja, Luque Ruiz de Somocurcio, Delgado-Morales, and Medina Zeballos, 2022), academic performance (Richardson, Abraham, and Bond, 2012), and ease in adjustment during the transition from high school to university (Friedlander, Reid, Shupak, and Cribbie, 2007). Conversely, low levels of self-esteem were linked to psychopathology such as depression and anxiety (Sowislo and Orth, 2013). Soto-Sanz et al. (2019) also mentioned that low levels of self-esteem are a risk factor for suicidal behavior among the youth; this relationship remains significant even after controlling for depression (Groholt, Ekeberg, Wichstrom, and Haldorsen, 2000). In Japan, previous studies suggested that university students with low levels of self-esteem are more likely to experience an increase in suicidal ideation (Mitsui et al., 2014; Dat et al., 2023).

Scholars demonstrate that interventions for self-esteem are a promising approach for improving mental well-being, especially among young adults (Bos, Muris, Mulken, and Schaalma, 2006). Results from randomized controlled trials (RCTs) indicate that such interventions are effective against anorexia nervosa (Biney, Giles, Hutt, Matthews, and Lacey, 2022), depressive symptoms (Bruhns, Ludtke, Moritz, and Bucker, 2021), and body dissatisfaction (Moffitt, Neumann, and Williamson, 2018). Japanese participants also report elevated psychiatric symptoms when participating in an intervention that incorporates self-esteem enhancement (Kunikata, Yoshinaga, and Nakajima, 2016). Additionally, improving self-esteem has been suggested to reduce suicidality (Soto-Sanz et al., 2019). From the results of Chapter I, participants in interventions that include a self-esteem component exhibited significantly reduced suicidal ideation at post-intervention and three-month follow-up (Dat et al., 2022). Accordingly, incorporating self-esteem enhancement as a treatment target could be an efficacious approach to suicide prevention.

An alternative self-image that could be a target for intervention is self-compassion. The concept of self-compassion has three major dimensions, namely, self-kindness versus self-judgment, common humanity versus isolation, and mindfulness versus over-identification (Neff, 2003a). Similar to self-esteem, high levels of self-compassion are associated with many positive outcomes among university students, such as improved well-being (Hope, Koestner and Milyavskaya, 2014), increased academic motivation (Kotera et al., 2022), or decreased perceived stress (Martinez-Rubio et al., 2023). Regarding the association between self-compassion and suicide, the results of a meta-analysis indicate that the positive dimensions of self-compassion (i.e., self-kindness, common humanity, and mindfulness) were negatively associated with suicidal thought and behavior (Suh and Jeong, 2021).

Previous studies point to self-compassion intervention as an effective treatment strategy for eating disorders, depression, stress, and anxiety (Ferrari et al., 2019). In Japan, young adults who participated in a self-compassion intervention displayed a significant reduction in symptoms of anxiety, depression, and negative emotions (Arimitsu, 2016). A study also emphasized that participants in a cognitively compassion-based training experienced a significant reduction in levels of suicidal ideation (LoParo, Mack, Patterson, Negi and Kaslow, 2018).

1.4.Bridging the Gap between Self-Esteem and Self-Compassion

While self-esteem enjoys a well-established position within psychology, self-compassion is an emerging area attracting increased research attention. As of May 16, 2024, a PubMed search for studies with "self-esteem" in the title yields 5503 articles. In contrast, there are only 1281 articles with "self-compassion" in the title over the same time periods. While direct date comparisons within this search aren't possible, the field of self-compassion research is demonstrably expanding. This growth is likely due to increasing recognition of self-compassion's potential benefits for mental health and

well-being, prompting more researchers to explore its various aspects and applications (Neff, 2023).

Although high levels of self-esteem and self-compassion have been associated with psychological benefits, each has its function in the development of mental well-being. For example, Kamalinasab and Mohammadkhani (2018) found that self-esteem and self-compassion can better predict strategies for adaptive and maladaptive emotion regulation, respectively. The literature also recommends improving self-compassion as a healthier alternative to enhancing self-esteem (Neff, 2003a). Indeed, studies that compared the efficacy of self-esteem and self-compassion interventions in reducing body image concern demonstrated that although both were effective, the self-compassion group displayed significantly higher levels of improvement than those of the self-esteem group (Moffitt et al., 2018; Seekis, Bradley and Duffy, 2017). However, Donald et al (2018) proposed that self-esteem is a key precursor for the development of self-compassion; thus, enhancing self-esteem may be similarly crucial to fostering self-compassion. The authors cited that this result could be due to the notion that the ability of individuals to show compassion for themselves would be firstly dependent on their perception of their worthiness. Furthermore, previous scholars highlighted that enhancing self-esteem and self-compassion simultaneously is an effective method for minimizing suicidal behavior among university students (El-Masri and El-Monshed, 2021). Consequently, incorporating self-esteem and self-compassion into one intervention could be beneficial in fostering a healthy self-image and preventing suicide among young adults.

1.5.Brief Psychoeducation for Suicide Prevention

Lengthy and intensive intervention programs could encounter high attrition rates, extensive time consumption, and costly administration (Moffitt et al., 2018). Research also provides promising evidence that a brief self-compassion-based intervention (three sessions; Smeets, Neff, Alberts and Peters, 2014) or self-esteem-based intervention

(four sessions; Dalgas-Pelish, 2006) could still be effective in fostering positive changes. As such, ascertaining whether or not a brief psychoeducation program that focuses on enhancing self-esteem and self-compassion could be effective in reducing suicidal behavior is important.

1.6.Purpose of the current chapter

In summary, the primary objective of the current study is to investigate the feasibility and acceptability of a brief psychoeducation program that targets self-esteem and self-compassion in university students experiencing suicidal ideation. The secondary aim is to explore changes in self-esteem, self-compassion, suicide risk, and other psychological outcomes at the post-intervention and follow-up periods. Specifically, the thesis's author hypothesized that participants in the psychoeducation program would experience reduced suicide risk, depression, and hopelessness and increased self-esteem and self-compassion at post-intervention and follow-up.

2. METHOD

2.1.Study design

The present study is a single-arm, feasibility, and acceptability study using a repeated measures design at four time points, namely, pre-intervention (T1), post-intervention (T2), four-week follow-up (T3), and eight-week follow-up (T4). The current study followed the guidelines stipulated by CONSORT for randomized pilot and feasibility trials (Eldridge et al., 2016).

2.2.Ethical considerations

The study protocol was registered retrospectively in the Japanese UMIN Clinical Trials Registry on March 22, 2021 (Registration ID: UMIN000043702). The protocol for the intervention study was also submitted to Hokkaido University Ethical Committee. Due to the sudden occurrence of the COVID-19 pandemic, the study protocol was modified and resubmitted to Hokkaido University. Details will be

discussed later. The study was finally approved by the Ethical committee on June 2021 (Approval ID: 20-031)

2.3.Participants

The participants were recruited when visiting the health care center of Hokkaido University for mental health counseling. The health care center serves as the school clinic and provides consultations specifically for students at risk of mental health problems. Participants were eligible if they (1) were Hokkaido University students, (2) were at least 18 years old, (3) were Japanese and (4) scored from 1 to 2 points for Item 9 (*“Thoughts that you would be better off dead, or of hurting yourself in some way”*) of the Patient Health Questionnaire-9 (PHQ-9).

The exclusion criteria were (a) international students, (b) students aged 30 years or older, (c) students who scored 20 points or higher in the PHQ-9 and 3 points for Item 9 of the PHQ-9, and (d) students who deemed unsuitable for the study by their attending doctors.

2.4.Procedure

We used a priori power analysis for a matched-pair Wilcoxon signed-rank test (G*Power 3.1.9.3; Heinrich-Heine University, Düsseldorf, Germany). With power, alpha, and effect size set at 0.80, 0.05, and 0.80, respectively, a power calculation demonstrated that a minimum sample size of 15 was required for the study.

Data were collected from April 2021 to March 2024. Consent form was collected from students (and from their guardians in the case that the student was aged less than 18 years). The consent form explained the purpose of the study, its benefit, and participant confidentiality. Additionally, participants who completed the psychoeducation program received a 1000-yen gift card.

2.5.Delivery of the psychoeducation program

The advisor of the thesis's author (NM) delivered the program on an individual basis at the health care center of Hokkaido University. NM is a registered clinical psychiatrist in Japan with an extensive experience of working with suicidal patients. The current study targeted participants at risk of suicide; thus, an individual format was selected to render the identification of participants at risk easy for the researcher and to provide intervention if necessary.

The current novel psychoeducation program is based on the previous literature that focused on enhancing self-esteem using techniques from cognitive behavioral therapy (CBT) and self-compassion interventions. Specifically, the contents of the program were modified to suit Japanese participants using materials from the books entitled *Self-esteem: A Proven Program of Cognitive Techniques for Assessing, Improving, and Maintaining Your Self-Esteem* (McKay and Fanning, 2016), *The Self-Esteem Workbook* (Schiraldi, 2016), and *The Mindful Self-Compassion Workbook* (Neff and Germer, 2018). The authors of these materials have been contacted and have given permission for their usage.

2.6.Rationale for each session in the intervention program

This study developed a four-session intervention program based on the reviewed literature. The program addresses self-esteem and self-compassion through the lens of the ITPS model, with each session lasting approximately 45 minutes. Each session begins with a review of the homework from the previous session followed by a discussion of the content for the current session. The session ends with a summary and introduces the homework for next session. Homework is a combination of techniques for enhancing self-esteem and self-compassion. The selection of each session in the intervention program was guided by the need to address specific aspects of self-esteem and self-compassion, following the core components of the ITPS model and the results of previous Chapters:

Session 1: Self-Esteem & Self-Compassion

The connection of the session content with the ITPS model: Previous studies have shown that self-esteem and self-compassion are significant protective factors against perceived burdensomeness and thwarted belongingness (Eades, Segal and Coolidge, 2019; Umphrey, Sherblom and Swiatkowski, 2021). Low self-esteem was also mentioned as an indicator of perceived burdensomeness (Van Orden et al., 2010). Moreover, the negative aspect of self-compassion, namely isolation and self-criticism were related to both thwarted belongingness and perceived burdensomeness respectively (Van Orden et al., 2010).

Session 2: Cognitive Distortion

The connection of the session content with the ITPS model: A previous study have indicated that the feeling of perceived burdensomeness is a type of cognitive distortion (Wolff et al., 2018). In addition, Wolff and colleagues (2018) also suggested that several types of cognitive distortion also exacerbate feelings of burdensomeness (e.g., catastrophizing, overgeneralization, personalization, selective abstraction). In a paper co-written by Van Orden, Joiner, and other colleagues, it has also been suggested that one way therapeutic intervention could target risk factors in the ITPS model is by addressing cognitive distortions (Stellrecht et al., 2006).

The connection of the session content with self-esteem and self-compassion: Studies have shown that cognitive distortions are highly associated with self-esteem and self-compassion. Specifically, each facet of the self-compassion scale has been shown to be significant predictors of cognitive distortion (Akin, 2010). The connection between self-esteem and cognitive distortion is clearly established. In their book 'Self-Esteem: A Proven Program of Cognitive Techniques for Assessing, Improving, and Maintaining Your Self-Esteem,' McKay and Fanning (2016) emphasize that targeting cognitive distortions is an effective way to promote positive self-esteem.

The connection of the session content with Chapter II's results: Another reason why this program includes a session specifically targeting cognitive distortions relates to the findings of Chapter II in this thesis. The results from the second chapter demonstrated that hopelessness and psychological distress mediate the link between low self-esteem and suicidal thoughts. Additionally, existing research (Jager-Hyman et al., 2014; Stromeier et al., 2016) further indicates that cognitive distortions, especially perfectionism, are major risk factors for both psychological distress and hopelessness. As a result, by equipping participants with skills to identify and challenge these negative thinking patterns, this session aims to ultimately reduce the risk of suicidal ideation through targeting cognitive distortion.

Session 3: Self-Criticism & Critical Behaviors

The connection of the session content with the ITPS model: Increased levels of internalized self-criticism has been proposed to ultimately result in social disconnection and experiences of thwarted belongingness (O'Connor and Noyce, 2008). Furthermore, self-criticism is suggested to lead to rumination and interpersonal stress, which in turns create feelings of thwarted belongingness and perceived burdensomeness (Shahar et al., 2020).

The connection of the session content with self-esteem and self-compassion: Reducing self-criticism and reframing the way we view critical behaviors is suggested to be two critical approaches in order to develop healthy self-esteem and self-compassion (Mckay and Fanning, 2016; Neff and Germer, 2018). Drawing from insights in "The mindful self-compassion workbook" by Neff and Germer (2018) and "Self-esteem: A proven program of cognitive techniques for assessing, improving, and maintaining your self-esteem" by McKay and Fanning (2016), the session content emphasizes reducing self-criticism and reframing the way we view critical behaviors as essential steps in this process.

Session 4: Suicide Prevention

The connection of the session content with the ITPS model: The final session on suicide prevention was created to directly addresses the concept of acquired capability for suicide. In the ITPS model, Van Orden and colleagues have stated that once acquired, capability for suicide is relative stable, hard to change and address in therapeutic treatment (Van Orden et al., 2010). However, a recent study suggests that a possible strategy to address acquire capability for suicide is by providing education about suicide and mental health to reduce stigma and increase access to knowledge and resources for individuals considering suicide and those in a position to help (Anestis et al., 2017). As a result, in the final session of the intervention, we attempt to address capability for suicides by educating participants on suicide risk factors, suicide statistics from Japan as well as introducing other resources for suicide prevention.

Figure 8 details each session of the intervention program and its alignment with the ITPS model. Table 6 shows the summary of the program.

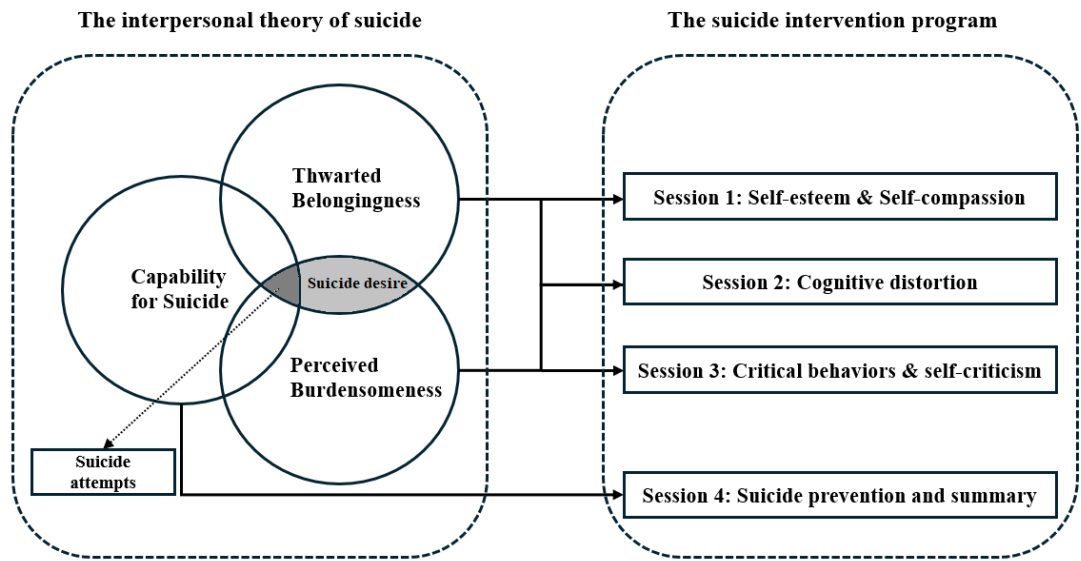


Figure 8. The ITPS model and the current self-esteem and self-compassion-based intervention program

Table 6. Contents of the psychoeducation program

Theme	Content description	Homework
1. Self-esteem and self-compassion	Definition of self-esteem and self-compassion; benefits of enhancing self-esteem and self-compassion; misconception about self-esteem and self-compassion in Japanese culture	“Listing your strengths and weaknesses” (McKay and Fanning, 2016): Guiding participants to acknowledge their strength and obtain an accurate view of their weakness.
2. Cognitive distortion	Types of cognitive distortion; effect of cognitive distortion on self-image; methods for coping with cognitive distortion	“Three-column technique” (McKay and Fanning, 2016): Helping participants to correct their cognitive distortion and achieve an objective view of themselves.
3. Critical behaviors and self-criticism	Teaching the mechanism of critical behaviors; the origin of self-criticism; coping methods for self-criticism and critical behaviors	“Disarm the critic” (McKay and Fanning, 2016): Helping participants to evaluate the toll of self-critical behaviors on their relationship, well-being and university performance. “How do I treat a friend?” (Neff and Germer, 2018): Helping participants to possess a compassionate view toward themselves.
4. Suicide prevention and program summary	Information on suicide prevention and a summary of the program	

2.7.Changes in study design imposed by the coronavirus disease (COVID-19) pandemic

The study was originally designed as an RCT with a wait-list control group. However, Hokkaido University was closed from March 2021 to December 2021 due to the pandemic, while the majority of school activities transitioned to online platforms. Thus, participant recruitment was suspended during this period. For this reason, the sample size was insufficient for creating a wait-list group; consequently, the study was modified as a single-arm pre-post study design. Additionally, a change to online intervention was considered but not adopted due to the lack of investigation on the efficacy of the new psychoeducation program.

2.8.Measures

The outcome measures were collected via self-report questionnaires. Demographic information, including gender, age, level of education, history of suicide attempt, and current treatments, was also obtained. Additionally, based on results of Chapter II, the BHS and PHQ-9 were chosen as the primary and secondary outcomes for the pilot study respectively.

Primary outcome measures:

Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965b): The RSES is a 10-item tool for measuring self-esteem using a five-point scale. Mimura and Griffiths (2007) translated the tool into Japanese. In the current study, the scale demonstrated a strong internal consistency ($\alpha = .81$).

Self-Compassion Scale (SCS; Neff, 2003b): The SCS is a 26-item measure for evaluating self-compassion in six dimensions, namely, self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. Items are rated using a five-point Likert-scale. The study used the Japanese version (Arimitsu, 2014) and obtained a high internal consistency ($\alpha = .89$).

Suicide module of the Mini-International Neuropsychiatric Interview (MINI; Sheehan et al., 1998): The study assessed suicide risk using the suicide module of the MINI, which includes six items. The total score is calculated using the sum of the scores for the six items. The study employed the Japanese translation by Otsubo et al. (2005). The subscale obtained Cronbach $\alpha = .88$, which is good.

Beck Hopelessness Scale (BHS; Beck, Weissman, Lester and Trexler, 1974): The BHS is a 20-item self-report scale for measuring the feeling of hopelessness using true or false statements. The Japanese version of the BHS (Tanaka, Sakamoto, Ono, Fujihara and Kitamura, 1996) was used in the present study. Cronbach's alpha for the BHS in the current study was high ($\alpha = .92$).

Secondary outcome measures:

Patient Health Questionnaire-9 (PHQ-9; Spitzer, Kroenke and Williams, 1999): The PHQ-9, which consists of nine items rated using a four-point Likert-scale. The Japanese version of the scale (Muramatsu et al., 2007) obtained Cronbach $\alpha = .92$.

Self-directedness subscale of the Temperament and Character Inventory (TCI; Cloninger, Svrakic and Przybeck, 1993): The study used the self-directedness subscale of the TCI to measure sense of autonomy using true or false statements. The Japanese version of the subscale exhibited good reliability and validity (Kijima, Tanaka, Suzuki, Higuchi and Kitamura, 2000), and excellent Cronbach's alpha ($\alpha = .88$).

Acceptability and feasibility outcome measures:

After completing the final session, the participants were invited to complete an interview for the acceptability of the psychoeducation program. Items on clarity, memorability, satisfaction, intent for future use, homework difficulty, homework length, and intent to practice homework in the future were rated using a six-point Likert-type scale (1 = Strongly disagree to 6 = Strongly agree). High scores indicate high acceptability. Open-ended questions on the difficulties and perceived benefits of the program were also posed.

Additionally, feasibility data on recruitment rates, retention to treatment, and attrition rate at post-treatment and follow-up were collected by the first author (NTD).

2.9.Data analysis

Analysis was conducted using JMP version 25 (SAS Institute Inc., Cary, NC) and R in the R studio environment (R Core Team, 2018). To evaluate the magnitude of within-subject changes for each outcome, the study calculated effect sizes using Hedges' g , because it is useful for accounting for biased estimates of the effect size in studies with small sample sizes (Cumming, 2012). Additionally, the study employed the Wilcoxon signed-rank test to assess differences between scores due to the small sample size and

the repeated-measure nature of the data. Individual reliable improvement and deterioration for RSES, SCS, BHS and PHQ-9 were computed using the Reliable Change Index (RCI) by Jacobson and Truax (1991). The literature proposes that the RCI value is useful for determining whether or not changes are of clinical significance and for testing manipulation in small-sample study (Zahra and Hedge, 2010).

3. RESULTS

The mean age of the sample was 22.53 years (SD = 2.35) with ages ranging from 18 to 28 years. All participants (N = 14) were Japanese. Among the participants, three (21.4%) have attempted suicide in the past. Table 7 presents detailed demographic information.

Table 7. Demographic information (N = 14)

Variable	N (%)
Gender	
Male	11 (78.6%)
Female	3 (21.4%)
Age	22.53 (2.35)
Education	
Undergraduate	7 (50%)
Graduate	7 (50%)
History of suicide attempt	
Yes	3 (21.4%)
No	11 (78.6%)
Currently receiving therapy	
Yes	1 (7.1%)
No	13 (92.9%)
Currently prescribed medications	
Yes	2 (14.3%)
No	12 (85.7%)

3.1. Feasibility of the psychoeducation program

In summary, the researchers approached 17 eligible participants, who all agreed to enter the psychoeducation program. Two, four and three participants withdrew during the program, at T3, and at T4, respectively. The retention rate at T2 was 82.4%. Compared with post-intervention, retention rates at T3 and T4 were 71.4% and 50%, respectively. Figure 9 depicts the recruitment and retention rates at each time point.

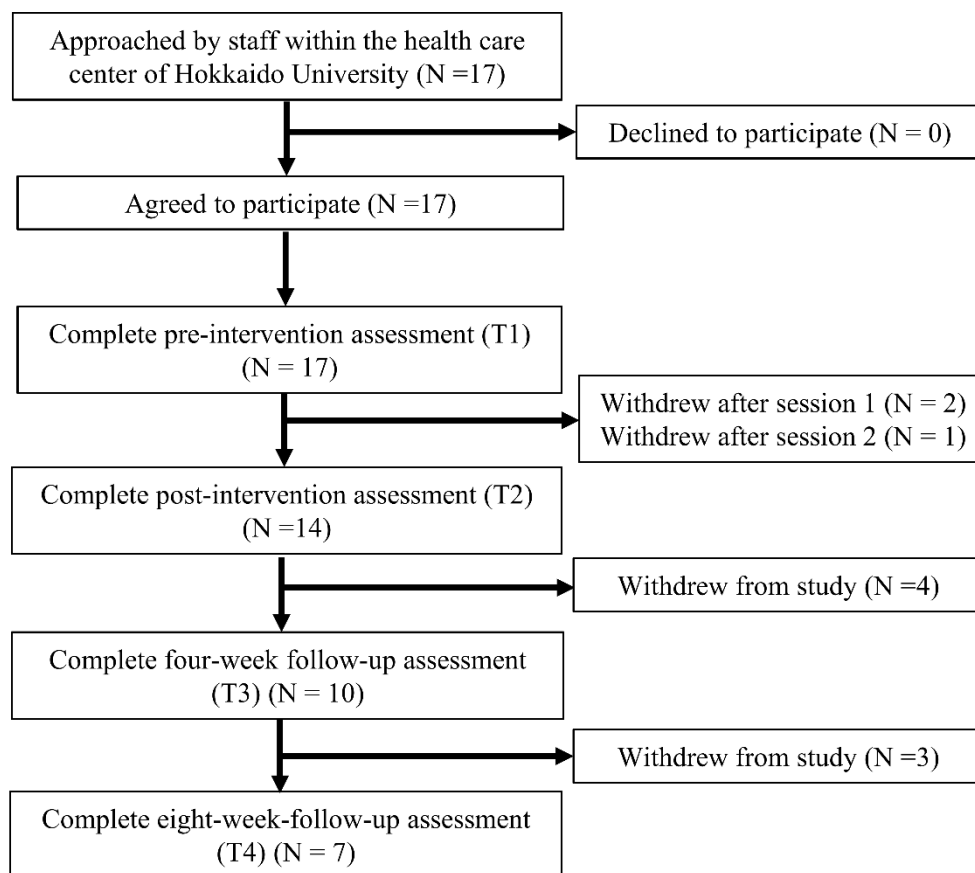


Figure 9. Flowchart for recruitment and retention rates at each stage of the study

3.2. Acceptability of the psychoeducation program

Table 8 presents the acceptability ratings. Only eight participants opted to answer the feedback's questionnaire. In terms of the acceptability of the program, the majority of the participants rated more than 4 for all items. This rating indicates that the materials of the intervention possessed high levels of clarity, memorability, and satisfaction. Moreover, these participants displayed high levels of intention to continue using the material of the program after the study. However, regarding the difficulty and length of the homework, the majority rated these items at 3 or lower, which indicates that they feel that the homework is difficult and relatively lengthy. Nevertheless, the majority providing ratings of 4 or higher for the intention to continue practicing the homework.

Table 8. Summary of acceptability ratings for the intervention (N = 8)

Items	1	2	3	4	5	6
1. The intervention was comprehensive	0 (0%)	0 (0%)	0 (0%)	0 (0%)	5 (62.5%)	3 (37.5%)
2. The intervention was memorable	0 (0%)	0 (0%)	0 (0%)	1 (12.5%)	6 (75%)	1 (12.5%)
3. I feel satisfied with the program	0 (0%)	0 (0%)	0 (0%)	1 (12.5%)	4 (50%)	3 (37.5%)
4. I plan to continue using the intervention in the future	0 (0%)	0 (0%)	0 (0%)	2 (25%)	3 (37.5%)	3 (37.5%)
5. The homework was easy to complete	0 (0%)	3 (37.5%)	2 (25%)	3 (37.5%)	0 (0%)	0 (0%)
6. The homework was concise.	0 (0%)	0 (0%)	5 (62.5%)	3 (37.5%)	0 (0%)	0 (0%)
7. I plan to continue practicing the homework in the future.	0 (0%)	0 (0%)	1 (12.5%)	2 (25%)	4 (50%)	1 (12.5%)

Note. 1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Somewhat Agree, 5 = Agree, 6 = Strongly Agree

In the open-ended feedback, the participants were asked about which aspect of the program they considered was the most difficult, which homework was the most helpful or difficult, and the changes they noticed after participating in the intervention. When asked about the difficult aspect of the program, one participant reported that the “...

homework was difficult to understand”, while another responded that they “... *understood the theory*” but “... *found it difficult to apply it to myself*”. Regarding homework, the participant mentioned that the three-column techniques in Session 2 was the most beneficial (N = 8). When asked for the reasons, they responded that it helped them to “... *reconsider my thinking*”, “... *think more positively*”, or “... *realize how distorted my own cognition was*.” Interestingly, two participants also reported that they found the homework for Session 2 as the most difficult. Additionally, the participants commonly reported that they found the homework for Session 3 (i.e., Disarm the critic and How do I treat a friend?) as the most difficult (N = 4). The reasons stated were that they “... *worried about whether what I had written could be considered self-criticism*.” or “... *self-critical thoughts did not manifest in concrete ways*...”. When asked about changes in themselves after joining the intervention, the participants mentioned that they became more objective (N = 3) or accepting of themselves (N = 2) because they could “... *think from multiple perspective when criticizing myself*...” or “... *pay attention to my own cognitive distortion more often than before*.”

Taken together, the ratings and feedback for the acceptability of the program was positive.

3.3.Data outcome measure

Table 9 and Table 10 presents the results for the primary and secondary outcomes. Figure 10 illustrates changes in the mean scores for the scores of self-esteem, self-compassion, suicide risk, hopelessness, and depression at each time point. The Wilcoxon signed-rank test indicated that self-compassion, hopelessness, depression, and suicide risk significantly changed from baseline to post-intervention. The largest effects were observed in the scores for self-compassion ($g = 1.02 [0.56; 1.48]$), followed by depression ($g = 0.62 [0.22; 1.03]$), hopelessness ($g = 0.49 [0.18; 0.79]$) and suicide risk ($g = 0.43 [0.06; 0.79]$).

Table 9. Mean and Standard Deviation of psychological variables

Variable	T1 M (SD) (N = 14)	T2 M (SD) (N = 14)	T3 M (SD) (N = 10)	T4 M (SD) (N = 7)
RSES	19.28 (3.99)	20.28 (4.29)	22.30 (4.00)	20.86 (2.91)
SCS	2.12 (0.52)	2.56 (0.47)	2.67 (0.38)	2.37 (0.44)
SK	2.08 (0.66)	2.77 (0.48)	2.66 (0.59)	2.77 (0.78)
SJ	4.21 (0.44)	3.9 (0.44)	3.84 (0.56)	4.06 (0.63)
CH	1.86 (0.75)	2.70 (0.64)	2.90 (0.81)	2.57 (0.76)
I	3.37 (0.93)	3.23 (1.00)	2.92 (0.81)	2.39 (0.52)
M	2.07 (0.65)	2.86 (0.72)	2.77 (0.53)	2.53 (0.62)
OI	4.11 (0.61)	3.80 (0.54)	3.92 (0.35)	4.21 (0.65)
MINI S	7.08 (5.88)	4.50 (4.31)	5.78 (5.12)	2.50 (3.51)
BHS	14.75 (4.02)	12.67 (3.91)	12.22 (3.38)	13.33 (1.37)
PHQ-9	11.64 (6.06)	7.86 (3.90)	9.80 (5.92)	8.71 (5.41)
TCI's SD	8.00 (3.46)	9.71 (5.65)	11.10 (4.95)	8.28 (3.09)

Note. RSES = Rosenberg Self-esteem Scale, SCS = Self-compassion scale, SK = Self-kindness, SJ =Self-judgment, CH = Common Humanity, I = Isolation, M = Mindfulness, OI = Over-identification, MINI S = Suicide module of The Mini-International Neuropsychiatric Interview, BHS = Beck Hopelessness scale, PHQ-9 = Patient health questionnaire-9, TCI's SD = The self-directedness subscale of Temperament and Character Inventory; T1 = pre-intervention, T2 = post-intervention, T3 = four-week follow-up, T4 = eight-week follow-up.

Table 10. Summary statistics and outcome data of psychological variables

Variable	T1 to T2 (N = 14)		T1 to T3 (N = 10)		T1 to T4 (N = 7)	
	<i>p</i>	<i>g</i> [95%CI]	<i>p</i>	<i>g</i> [95%CI]	<i>p</i>	<i>g</i> [95%CI]
RSES	0.203	0.23[-0.16; 0.62]	0.043*	0.53[0.08; 0.98]	0.031*	0.74[0.16; 1.33]
SCS	<.001*	1.02[0.56; 1.48]	0.006*	1.04[0.39; 1.69]	0.031*	1.39[0.28; 2.48]
SK	0.002*	1.10[0.36; 1.85]	0.021*	0.91[0.20; 1.63]	0.016*	1.17[0.39; 1.95]
SJ	0.015*	0.67[0.16; 1.18]	0.047*	0.71[-0.05; 1.47]	0.047*	0.52[0.04; 0.99]
CH	<.001*	1.12[0.50; 1.74]	0.002*	1.17[0.45; 1.90]	0.016*	1.47[0.54; 2.40]
I	0.425	0.14[-0.09; 0.37]	0.129	0.41[-0.11; 0.94]	0.187	0.44[-0.28; 1.16]
M	0.001*	1.07[0.47; 1.68]	0.043*	0.85[0.02; 1.68]	0.109	0.73[-0.09; 1.54]
OI	0.044*	0.49[0.05; 0.94]	0.492	0.25[-0.35; 0.86]	0.875	0.13[-0.69; 0.95]
MINI S	0.016*	0.43[0.06; 0.79]	0.219	0.34[-0.27; 0.95]	0.031*	0.47[0.15; 0.78]
BHS	0.008*	0.49[0.18; 0.79]	0.057	0.51[-0.01; 1.03]	0.031*	2.26[1.00; 4.42]
PHQ-9	0.004*	0.62[0.22; 1.03]	0.191	0.50[-0.22; 1.22]	0.078	0.89[-0.09; 1.88]
TCI's SD	0.463	0.34[-0.36; 1.04]	0.016*	0.87[-0.25; 1.99]	0.156	0.38[-0.10; 0.86]

Note. RSES = Rosenberg Self-esteem Scale, SCS = Self-compassion scale, SK = Self-kindness, SJ =Self-judgment, CH = Common Humanity, I = Isolation, M = Mindfulness, OI = Over-identification, MINI S = Suicide module of The Mini-International Neuropsychiatric Interview, BHS = Beck Hopelessness scale, PHQ-9 = Patient health questionnaire-9, TCI's SD = The self-directedness subscale of Temperament and Character Inventory; T1 = pre-intervention, T2 = post-intervention, T3 = four-week follow-up, T4 = eight-week follow-up. CI = Confidence Interval, *g* = Hedges' *g* effect size, *p* = The Wilcoxon signed ranks two-tailed test used to calculate significance levels of changes.

At the four-week follow-up, the Wilcoxon signed-rank test demonstrated significant changes between baseline and one-month-follow-up for self-esteem, self-compassion, and self-directedness. However, only self-compassion and self-esteem demonstrated a significant effect size with self-compassion continuing to maintain a large effect size (*g* = 1.04 [0.39; 1.69]) and self-esteem demonstrating a moderate effect size (*g* = 0.53 [0.08; 0.98]).

At the eight-week follow-up, the Wilcoxon signed-rank test demonstrated that self-esteem (*g* = 0.74 [0.16; 1.33]) and self-compassion (*g* = 1.39 [0.28; 2.48]) remained

significant with moderate to large effect sizes, respectively. Additionally, suicide risk ($g = 0.47 [0.15; 0.78]$) and hopelessness ($g = 2.26 [1.00; 4.42]$) returned to be significant with moderate to large effect sizes, respectively.

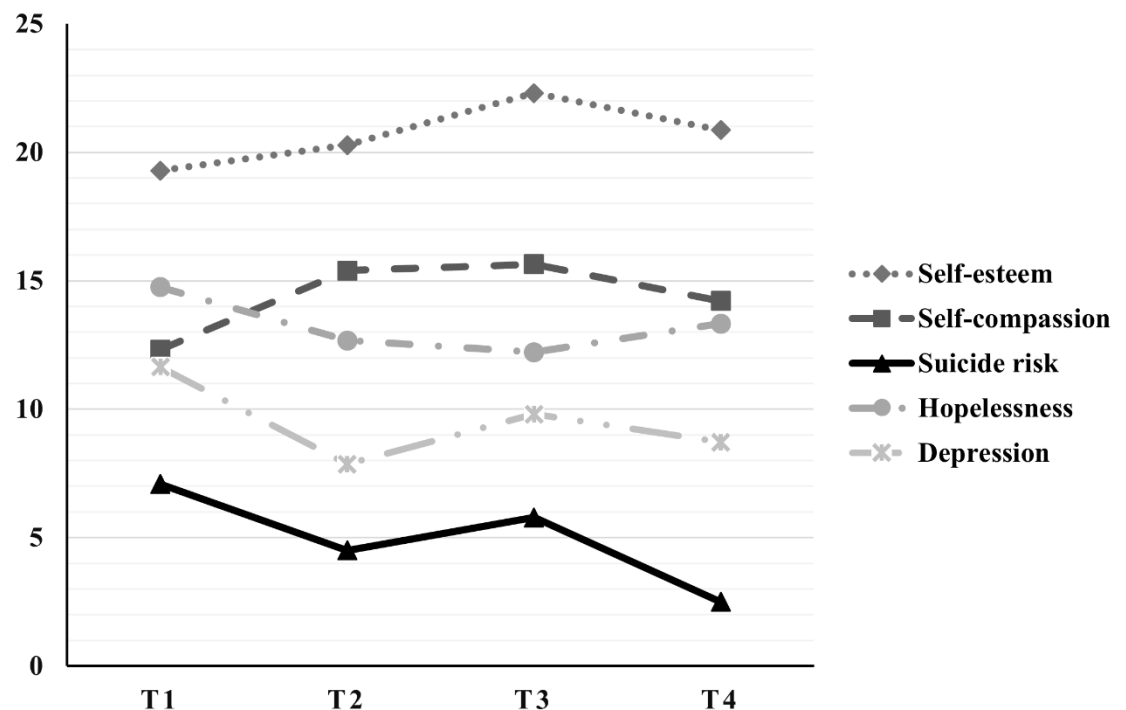


Figure 10. Changes in mean scores of outcome measures over time

3.4.Clinical significance and reliable change

The study calculated the rate of reliable change (Wilfong, Goodie et al., 2021) for self-esteem, self-compassion, hopelessness, and depression (Table 11). Among 14 participants, the post-intervention results revealed clinically significant changes for self-esteem, self-compassion, hopelessness, and depression for two, seven, two, and four participants, respectively. For 10 participants who remained at the four-week follow-up, two, five, two, and four displayed reliable improvements in self-esteem, self-compassion, hopelessness, and depression, respectively. Notably, one participant exhibited a reliable deterioration in depression score at the four-week follow-up. At the

final eight-week follow-up, out of seven, the numbers of participants that displayed clinically significant improvements in self-esteem, self-compassion, hopelessness, and depression were one, five, one, and three, respectively.

Table 11. Clinically significant changes and RCI analysis for outcome measures

	T1 to T2 (N = 14)		T1 to T3 (N = 10)		T1 to T4 (N = 7)	
	CSI	CSD	CSI	CSD	CSI	CSD
RSES	2 (14.3%)	0 (0%)	2 (20%)	0 (0%)	1 (14.3%)	0 (0%)
SCS8	7 (50%)	0 (0%)	5 (50%)	0 (0%)	5 (71.4%)	0 (0%)
BHS	2 (14.3%)	0 (0%)	2 (20%)	0 (0%)	1 (14.3%)	0 (0%)
PHQ-9	4 (28.6%)	0 (0%)	4 (40%)	1 (10%)	3 (42.8%)	0 (0%)

Note. CSI = Clinically significant improvement, CSD = Clinically significant deterioration; RSES = Rosenberg Self-esteem Scale, SCS = Self-compassion scale, BHS = Beck Hopelessness scale, PHQ-9 = Patient health questionnaire-9; T1 = pre-intervention, T2 = post-intervention, T3 = four-week follow-up, T4 = eight-week follow-up.

4. DISCUSSION

In terms of the feasibility of the psychoeducation program, retention rates at post-intervention, four-week follow-up, and eight-week follow-up reached 82.4%, 71.4%, and 50%, respectively. Although the attrition rate at follow-up was relatively high, the high completion rate of the participants imply that the program was promising. The completion rate of the current psychoeducation program is also similar to those found in brief self-compassion and self-esteem interventions for women with obesity (Haley, Dolbier, Carels and Whited, 2022) and disabilities (Nosek, Robinson-Whelen, Hughes and Nosek, 2016). This finding indicates that a brief self-esteem and self-compassion program would be effective in maintaining the engagement of participants.

The ratings and open-ended feedback of the participants on the acceptability of the program were positive. In summary, participants responded that they found the program beneficial and could be implemented in daily practice. Regarding the open-ended

feedback for homework, all commented that the three-column technique was the most helpful one. Three-column technique is a technique in CBT that focuses on identifying and modifying cognitive distortion, which leads to decreased self-critical thoughts and improved self-esteem (McKay and Fanning, 2016). In a study on the efficacy of CBT-based self-help materials, previous scholars also reported the three-column technique as beneficial and easily applicable to daily situations (Öztemiz and Tekindal, 2022). Additionally, a prior investigation indicates that cognitive distortion are moderators of treatment outcomes, and interventions that focus on decreasing cognitive distortion are especially efficacious in improving mental health (Curry, 2006). Taken together, this result points to the good acceptability of the present intervention for Japanese university students with suicidal ideation.

Furthermore, analysis indicates that the participants experienced positive improvements in clinical outcomes at post-intervention and follow-up, especially in terms of self-esteem, self-compassion, suicide risk and hopelessness. We also find clinically reliable improvement for a number of participants, especially in terms of self-compassion. These results partially support our hypothesis that undergoing the psychoeducation program would result in improvements in mental health outcomes. The current findings are also consistent with those of previous clinical trials (Biney et al., 2022; Bruhns et al., 2021; LoParo et al., 2018), which demonstrates that improving self-esteem and self-compassion could lead to positive changes in mental health.

Compared with lengthy and intensive interventions, brief ones achieve high retention rates, are more cost-effective and efficient, and less labor-intensive, while remaining effective in improving mental well-being (Haley et al., 2022; Moffitt et al., 2018). Furthermore, brief interventions potentially reduce suicidal behavior (Knagg, Pratt, Taylor and Palmier-Claus, 2022), even at two-year-follow-up (Gysin-Maillart, Schwab, Soravia, Megert and Michel, 2016). In addition, the effect size for suicide risk in the present study was $g = 0.43$ (95% CI = [0.06; 0.79]) at post-intervention, which is

larger than the effect sizes for school-based prevention programs ($g = 0.3$, 95% CI = 0.15; 0.45) or self-guided digital interventions ($g = 0.18$, 95% CI = 0.10; 0.27) for suicidal behavior based on recent meta-analyses (Gijzen, Rasing, Creemers, Engels and Smit, 2022; Torok et al., 2020).

Unexpectedly, despite specifically targeting self-esteem, the related scores only displayed significant improvements at the follow-up but not the post intervention period. The results are in contrast with those of a previous 12-session self-esteem intervention using CBT among the Japanese population that found significant improvement in self-esteem post-intervention (Kunikata et al., 2016). A potential explanation for the non-significant result could be found in the model of low self-esteem by Fennell (2016). The theory proposes that low levels of self-esteem emerge from a constellation of maladaptive core beliefs, which have been developed over time. Habitual negative thinking and unhelpful behavioral responses further strengthen these negative core beliefs across one's lifetime (p.42). Thus, compared with self-compassion, self-esteem may be more resistant to changes. Furthermore, the present study was conducted during the COVID-19 period, when many university students are reported to experience prolonged mental and emotional distress (Ebrahim et al., 2022). As a result, changes in self-esteem during this period may be delayed, given that negative self-beliefs are perpetuated and reinforced by these experiences. The COVID-19 pandemic may also serve as an explanation for the fluctuations observed in scores of suicide risk, depression, and hopelessness, underscoring its significant impact on mental health.

Despite fluctuations in changes in other outcomes, changes in self-compassion remained significant and stable throughout the study, which suggests that the program is especially efficient in improving self-compassion. This result is consistent with that of Arimitsu (2016), who reported that a self-compassion intervention was highly acceptable and beneficial for Japanese university students, with the practice of self-compassionate behaviors rated as the most beneficial. Furthermore, a longitudinal study

indicated that improvements in self-compassion were linked with better mental well-being across a five-year follow-up (Lee et al., 2021). Consequently, a possibility exists that the consistent enhancement of self-compassion, which was experienced by the current respondents, may continue to benefit them in the future.

4.1.Limitations

The study has several methodological limitations that need to be addressed. First, the small sample size and the single-arm design could result in an inflated effect size (Knagg et al., 2022). Furthermore, the lack of a control group and randomization signals that confounding variables may likely influence the results. However, the pandemic limited the number of eligible participants; thus, the study implemented a single-arm study design. As such, although the results are promising, they should be interpreted with caution.

Second, only one therapist (NM) delivered the psychoeducation program. Therapists are considered to exert a major impact on the outcomes of patients in intervention studies. A meta-analysis indicated that therapist effects exist in an average of 8.2% of RCTs (Johns, Barkham, Kellett and Saxon, 2019). As a result, specific therapist effects, instead of intervention ones, could influence the current results.

Lastly, the intervention suffered from high drop-out rates during the follow-up periods. This result was consistent with those of previous studies, which demonstrate that attrition rates in suicide intervention studies typically exceed 30% (Crane and Williams, 2010; De Jaegere et al., 2019; Torok et al., 2022).

5. POSSIBLE PROGRAM MODIFICATIONS BASED ON PARTICIPANT FEEDBACK AND DATA ANALYSIS

Based on the comprehensive feedback from participants and analyses of collected data, there are several recommendations for the modification of the present intervention program to better meet the needs of future participants.

Building upon the findings of this pilot study, a more in-depth randomized controlled trial (RCT) should be the next step. However, the proposed wait-list control design mentioned in the protocol registered in the UMIN system might not be appropriate for this high-risk sample. Future intervention studies should consider a treatment as usual control group (i.e., standard care) or a control group receiving different treatment methods (such as a CBT intervention group).

For a future RCT, another key improvement will be a larger sample size. Based on the present pilot study's effect size of 0.4 for suicide risk, a power analysis using G*Power indicated that a t-test with two groups (intervention and control) and an alpha of 0.05 (significance level) would require a total sample size of 59 participants to achieve a power of 0.95. Considering a potential 20% dropout rate observed in the pilot study, it is recommended that a future RCT design would require recruiting approximately 35 participants per group to maintain adequate sample size for statistical analysis.

Given the positive pilot study results, the psychoeducation program's potential benefits may extend beyond suicide risk reduction. Specifically, while the program's primary focus was on self-esteem, self-compassion and suicide risk, participants in the current study also showed significant improvement in depressive symptoms at post intervention and in hopelessness at post-intervention and 8-week follow-up. Considering the program's positive effects on depression and hopelessness in addition to suicide risk, examining its efficacy for students experiencing other mental health issues is warranted. One possible area for future research is examining the effectiveness of the current program on university students with depressive symptoms. Given the established link between suicidal behaviors and depressive symptoms in university students (Furr et al., 2001), the current program, with modifications to target depressive symptoms more effectively, could also yield positive results in reducing such symptoms within this population. Moreover, the program's focus on promoting a positive self-

image through challenging negative thoughts and self-critical behaviors aligns with therapeutic approaches for eating disorders (Mantilla, Bergsten and Birgegård, 2014), suggesting its potential benefit for this population as well. Studies have shown the effectiveness of self-compassion interventions in reducing symptoms among patients with disordered eatings (e.g., Boggiss et al., 2020; Kelly and Carter, 2015), and a variety of depressive population such as postpartum depression (Guo et al., 2020) or treatment-resistant depression (Foroughi et al., 2020). For self-esteem-intervention, a mobile-based self-esteem intervention reduced depressive symptoms among students with depression (Bruhns et al., 2021). Similarly, studies have shown that interventions focused on self-esteem improvement are effective in reducing symptoms associated with eating disorders (O'Dea and Abraham, 2000; Wade, Davidson and O'Dea, 2003). Accordingly, the current program's positive effects on secondary results like depression and hopelessness suggest potential in addressing a wider range of mental health issues in university students.

In retrospect, we did not ask participants' ratings on the acceptability and usefulness of each session, which is an oversight that future studies should address to enhance the program's evaluation. Accordingly, for the rating of acceptability of the program, future studies should aim to gather participants' opinions on the content of each specific section of the program to ensure that it effectively addresses their needs and concerns. Furthermore, to ensure a correct assessment of participants, it is recommended that feedback on the content of each session should be collected at the end of each session rather than waiting until the final session.

For the content of the program, some participant reported that they found it difficult to apply what they learnt in the program into daily life. A possible way to improve participant understanding would be providing more real-life examples and case studies that show how theoretical concepts can be applied practically. This can help participants relate the material to their own experiences. Indeed, it has been reported that

incorporating real-life examples of the skill that are applicable to the participant context in the psychoeducation program can be used to clarify the theory of the program (Mastoras et al., 2011).

As acknowledged in the limitations, the intervention program employed a single therapist, which could introduce therapist bias into the results. It is recommended that future studies should recruit and train additional therapists to deliver the intervention program. Furthermore, in order to minimize therapist-specific variations that could affect outcomes, it may be necessary to develop a comprehensive training manual and conduct regular supervision sessions to ensure all therapists deliver the program consistently and adhere to the protocol. The therapist from the pilot study (NM) could then train future therapists using the program manual to ensure consistent delivery in future interventions.

A final issue that needs to be addressed in future studies is the high dropout-rates. It should be noted that high dropout rates are a persistent challenge in intervention studies, especially those targeting populations at risk for suicide. A meta-analysis of drop-out rates from psychotherapies before 1990 was at 46,9% (Wierzbicki and Pekarik, 1993), while a more recent meta-analysis from 1990 to 2010 reported a significant lower dropout rates at 19,7% (Swift and Greenberg, 2012). The guideline provided by Gibbons et al. (2010) for the retention of participants with suicide attempt in clinical trials recommends that attrition rates during the intervention phase could be reduced using two strategies. The first is increasing the number of available therapists to enable flexibility in treatment schedules. The second is emphasizing potential obstacles to attendance and addressing them. Thus, when replicating and expanding the study in the future, attendance in the psychoeducation program could be improved by increasing the number of interventionists and extensively discussing the obstacles for program attendance with potential participants.

6. CHAPTER CONCLUSION

The study presented high levels of feasibility and acceptability for a brief psychoeducation program based on self-esteem and self-compassion for university students at risk for suicide. Additionally, the program provided preliminary evidence for the improvement on clinical outcomes, especially self-esteem, self-compassion, hopelessness, and suicide risk. Given the current findings, future steps should include modifying the contents of the program according to feedback from participants and the results of data analysis; increasing the number of interventionists; and implementing a randomized controlled design. Ultimately, the results justify a larger and more rigorous trial design for further evaluation.

CONCLUSION

- The current thesis examines the link between self-image and suicidal behaviors using three approaches: Mediation analysis; Systematic Review and Meta-analysis; and Pilot study.

Chapter I

- In the first chapter a systematic review and meta-analysis were employed to assess the impact of self-esteem interventions on suicidal behaviors.
- Most interventions for suicidal ideation were adaptations of existing therapies, mainly using CBT techniques to target self-esteem.
- The meta-analysis revealed that participants in these interventions showed a small but significant reduction in suicidal ideation compared to controls, with this effect persisting at a 3-month follow-up.
- Chapter I establishes the feasibility and potential effectiveness of self-esteem interventions in reducing suicide risk.
- The prevalence of CBT techniques in these interventions suggests that CBT is a common and effective method for improving self-esteem and addressing suicidal behaviors.

Chapter II:

- The second chapter examines the serial mediation role of psychological distress and hopelessness in the relationship between self-esteem and suicidal ideation.
- The study also explored whether this mediation process differed pre-pandemic and during the pandemic.
- The results show that low self-esteem leads to increased psychological distress, followed by hopelessness, resulting in heightened suicidal ideation.
- During COVID-19, psychological distress exerted a stronger influence on suicidal thoughts, highlighting its importance in suicide prevention programs.
- Chapter II establishes a causal link between self-esteem and suicidal ideation

through psychological distress and hopelessness.

- The findings emphasize the need to target psychological distress and hopelessness in interventions to reduce suicidal ideation, especially in the context of ongoing mental health challenges from the pandemic.

Chapter III

- The final chapter investigates the effectiveness of a new self-esteem and self-compassion intervention for reducing suicide risk among Japanese university students.
- The program is based on findings from Chapters I and II and the ITPS, targeting psychological distress and hopelessness using CBT and self-compassion techniques.
- The results indicate high acceptability and feasibility for the program, with promising outcomes in improving self-compassion, self-esteem, and reducing suicidal behaviors.
- Despite limitations such as a small sample size, lack of a control group, and high drop-out rates, the study's positive results warrant further investigation in a more rigorous research design.

Conclusion

- The thesis provides significant insights into the relationship between self-image and suicidal ideation.
- Chapter I reinforces the potential of self-esteem interventions, particularly those incorporating CBT techniques, to reduce suicidal behaviors.
- Chapter II identifies psychological distress and hopelessness as critical mediators, offering valuable targets for future interventions.
- Chapter III demonstrates the promise of a new self-esteem and self-compassion program, especially for Japanese university students at risk of suicide.
- Overall, the thesis lays the groundwork for future research to further develop and evaluate targeted suicide prevention strategies.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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