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ORIGINAL RESEARCH

The Suicidal Ideation of Disaster Victims: A Nationwide Cross-Sectional Study

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Purpose: Various natural and human made disasters occur worldwide. This study aimed to identify the factors affecting suicidal ideation in victims of disasters such as typhoons, heavy rainfall, fires, and earthquakes.

Methods: Data were obtained from a long-term survey on life changes among disaster victims conducted in 2019 by the National Disaster Management Research Institute. The study included 2234 victims of natural and social disasters occurring in Korea between 2012 and 2018. Suicidal ideation was assessed using the Korean version of the Composite International Diagnostic Interview developed by the World Health Organization. The participants' demographic characteristics, disaster-related characteristics, physical characteristics, psychological characteristics, and social characteristics were analyzed as the influencing factors. The data were analyzed using the chi-square test, *t*-test, and logistic regression.

Results: Of the 2234 subjects in this study, 32 were disaster victims who had experienced suicidal ideation, accounting for 1.4%. The results showed that the factors affecting suicidal ideation included disaster-related injury/disease, depression, and social support. The odds ratio of suicidal ideation was higher when there was injury/disease (OR=1.89, 95% CI=0.07–0.48), with higher depression levels (OR=1.31, 95% CI=1.18–1.47) and with lower social support (OR=0.94, 95% CI=0.90–0.99).

Conclusion: This study identifies the significant influencing factors of suicidal ideation in disaster victims, which were as follows: disaster-related injury or disease, depression, and social support. Our study's findings would contribute to screening high-risk groups of suicidal ideation and developing effective support, interventions, and suicide prevention programs for disaster victims. Furthermore, to prevent suicide and promote the healthy recovery of disaster victims, mental health care services aimed at suicide prevention should be reinforced and the victims should be provided with psychological support and treatment without financial burden.

Keywords: disasters, disaster victims, suicidal ideation, depression, social support

Introduction

Natural disasters such as typhoons, heavy rainfall, floods, and earthquake, as well as social disasters such as fires, landslides, and terrorism are occurring frequently worldwide.[1] A disaster is a large-scale event that occurs suddenly, disrupting the basic organization and normal functioning of a community, which leads to extensive damage that is difficult to manage through common practices or be resolved without external help in terms of livelihood, property, and living conditions (The United Nations International Strategy for Disaster Reduction, 2004). Furthermore, disaster victims make complaints of not only economic damage[2] but also physical[3] and psychological damage, such as depression[4] and posttraumatic stress disorder (PTSD).[5] When these problems persist for a long period among several disaster victims, they may turn into a social problem, extending beyond the individual and family.[6]

Previous studies on disasters reported an increase in mortality rates of disaster victims due to suicidal ideation and suicide.[7,8] Suicide deaths increased by 41% in 3 months after 2015 Nepal earthquake.[7] In addition, after the 2011 Fukushima nuclear accident in Japan, suicide attempts increased 3~4 times in the 4 months after the disaster occurred.[9] To an individual or family, a disaster is a sudden traumatic event. Suicidal ideation is induced by a traumatic or severely stressful event, and is highly likely to result in suicidal behaviors.[10] Moreover, if the post-disaster physical damage or

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psychological instability is left untreated, a victim may end up completing suicide in certain cases.[9] The World Health Organization (WHO) highlights the importance of national strategies regarding suicide prevention and recommends that each government respond proactively to the suicide problem.[11] It is noteworthy that the number of suicide victims per 100,000 population in South Korea was 25.7 in 2020, the highest among Organisation for Economic Co-operation and Development (OECD) countries.[12] A deeper understanding of the suicidal ideation of disaster victims may contribute to decreasing the risk of actual suicide attempts, thus preventing suicide. Therefore, it is necessary to determine the factors that influence the current status of suicidal ideation of disaster victims in South Korea.

Previous studies conducted worldwide regarding the influencing factors of suicidal ideation in disaster victims have reported on the effects of demographic characteristics such as age[13] and low socioeconomic status,[14,15] disaster-related characteristics such as disaster type[16] or property loss,[17] physical health status such as physical injury,[15] psychological state such as depression and anxiety[13,15,18] and PTSD,[9] and social status such as inadequate social support;[15] however, there is a general lack of studies combining these factors into large-scale data to explore the influencing factors associated with disaster victims.

Thus, the present study used data of a long-term survey on the change of life of disaster victims (LSCLDV) to identify the effects of demographic characteristics, disaster-related characteristics, subjective health status, psychological state, and social status on suicidal ideation in disaster victims. This study's findings will serve as basic data for suitable interventions and suicide prevention programs for disaster victims during the processes of disaster prevention, response, and recovery.

Materials and Methods

Study Design

This study was conducted as a cross-sectional investigation using data from a 2019 panel survey of disaster victims to identify the influencing factors of suicidal ideation.

Participants

The raw data of the fourth LSCLDV conducted in 2019 by the National Disaster Management Research Institute (NDMI) was used in this study.[19] The LSCLDV has been conducted since 2016, up till the fourth survey in 2019. The subjects were victims of natural disasters (typhoon, heavy rainfall, and earthquake) or social disasters (fire) between 2012 and 2018. After defining the sample size for each type of disaster, a research panel was extracted using systematic sampling that incorporated the participants' residential area, gender, and age. The research included 2300 individuals overall in 2019; among these, 2234 adults aged ≥ 19 years were the subjects of this study. In a post hoc power analysis using G*Power 3.1 program, the observed power for the sample of 2234 was 0.99.

Variables and Measurement

The fourth LSCLDV collected data under the following six domains: the experience of disaster, physical health status, psychological state, social status, economic status, and relief service. The questions used in this study were regarding the demographic characteristics (gender, age, marital status, education, household type, and average monthly income), disaster-related characteristics (type of disaster, time passed since disaster, and disaster-related injury or disease), subjective health status, psychological state (depression, anxiety, PTSD, and resilience), social status (social support and social adjustment), and suicidal ideation.

Demographic Characteristics

The following items assessed the participants' demographic characteristics: gender, age, marital status, education, household type, and average monthly income. Age was categorized into groups of 19–39 years, 40–64 years, and ≥ 65 years. Based on marital status, participants were categorized into unmarried, divorced, and bereaved. Educational level was categorized into ≤ middle school and ≥ high school, household type into one-person household and multi-person household, and average monthly household income was divided into < 3 million won and ≥ 3 million won. The reason for classifying it as 3 million won is that the median monthly household income of the Korean sample households

is 2.65 million won in 2021.[20] In the original survey, disaster victims were surveyed in the units of 1 million won, so in this study, the income category was classified as 3 million won.

Disaster-Related Characteristics

Questions to determine the disaster-related characteristics included the type of disaster, time passed since disaster, and disaster-related injury or disease (Included both physical and psychological injury or disease). Time passed since disaster was defined as the time between the year of the disaster and that of the current research; it was categorized into the groups of ≤ 2 years, 2–5 years, and 6–7 years. Disaster-related injury or disease was assessed based on the responses of yes or no to the question, "Have you suffered an injury or disease related to the disaster?"

Subjective Health Status

To determine the subjective health status, the overall health status was measured on a 7-point Likert scale ranging from 1 = "Very poor" to 7 = "Very good". Scores of 1–3 indicated poor health, 4 indicated moderate health, and 5–7 indicated good health.

Psychological State

To assess the participants' psychological state, the following items were included: depression, anxiety, PTSD, and resilience. Depression was measured using the Patient Health Questionnaire-9 (PHQ-9) developed by Spitzer et al[21] and translated into Korean and validated by An et al.[22] The PHQ-9 is used in the diagnosis of major depressive disorder and includes nine items on interest, mood, fatigue, and appetite in the recent past two weeks, with each item scored on a 4-point Likert scale ranging from 0 = "Never" to 3 = "Almost every day". The scores of all items are added, with higher scores indicating higher levels of depression. The tool reliability was Cronbach's α=.95 at the time of development and Cronbach's α=.92 in this study.

Anxiety was measured using the Korean-translated version of the Generalized Anxiety Disorder-7 scale (GAD-7) developed by Spitzer et al,[23] which is available at http://www.phqscreeners.com/select-screener. The GAD-7 comprises seven questions, each rated on a 4-point Likert scale ranging from 0 = "Never" to 3 = "Almost every day", regarding symptoms of anxiety experienced in the past two weeks. The scores of all items are added, with higher scores indicating higher levels of anxiety. The tool reliability was Cronbach's α=.92 at the time of development and Cronbach's α=.93 in this study.

PTSD was evaluated using the Impact of Event Scale-Revised (IES-R) developed by Weiss and Marmar.[24] The Korean version[25] was used in this study. The IES-R comprises 22 questions—8 items on intrusive thoughts, 8 items on avoidant behaviors, and 6 items on hyperarousal symptoms—each rated on a 5-point Likert scale ranging from 0 = "Not at all" to 4 = "Extremely" regarding the frequency of thoughts and feelings related to the traumatic event in the past seven days. The scores are added, with higher scores indicating higher levels of PTSD. The tool reliability was Cronbach's α=.83 at the time of development and Cronbach's α=.98 in this study.

Resilience was measured using six items of the Brief Resilience Scale (BRS) developed by Smith et al,[26] after translation and modification by the NDMI to be made suitable for disaster experiences. Each item is rated on a 5-point Likert scale ranging from 0 = "Not at all" to 4 = "Extremely;" items 2, 4, and 6 required reverse coding. The scores are added, and higher scores indicate higher levels of resilience. The tool reliability was Cronbach's α=.60 at the time of development and Cronbach's α=.79 in this study.

Social Status

To determine participants' social status, the levels of social support and adjustment were measured. Social support was measured using a tool developed by Park,[27] after restructuring it into 12 questions regarding four subcategories—emotional support, appraisal support, information support, and instrumental support. Each item is scored on a 5-point Likert scale ranging from 1 = "Not at all" to 5 = "Extremely". The scores are added, and higher scores indicate higher levels of social support from close relations. The tool reliability was Cronbach's α=.94 at the time of development and Cronbach's α=.95 in this study.

Social adjustment was measured using the Work and Social Adjustment Scale.[28] The scale comprises five questions measuring the influence of a disaster-related physical or psychological problem on task performance, personal relations,

and leisure activities; each item is rated on a 5-point Likert scale ranging from 0 = "Not at all" to 4 = "Extremely". The scores are added, with higher scores indicating lower levels of social adjustment due to disaster. The tool reliability was Cronbach's α=.78-.94 at the time of development and Cronbach's α=.97 in this study.

Suicidal Ideation

For suicidal ideation, a question related to suicide was adopted from the Korean version[19] of the Composite International Diagnostic Interview (CIDI) developed by the WHO. The measurement was based on the yes or no response to the question, "Have you seriously considered completing suicide in the past year?"

Data Collection

The NDMI determined the sample size allocated by disaster type from the disaster victim population in Korea between 2012 and 2018, and then recruited survey participants through a preliminary telephone survey. Afterwards, expert researchers visited individual households for computer-aided face-to-face interviews. Our researchers submitted the study protocol describing the use of the LSCLDV data to the NDMI. Following the approval, data were provided after anonymization to prevent personal identification.

Data Analysis

For the data analyses, SPSS IBM 25 was used. The demographic characteristics were analyzed through descriptive statistics, while the variation in suicidal ideation according to the demographic characteristics was analyzed using a chi-squared test and independent *t*-test. Statistically significant variables were analyzed using binominal logistic regression to identify the factors that influence the suicidal ideation of subjects.

Results

Demographic Characteristics

The number of males among the subjects was 44.2% and that of females was 55.8%. The mean age was 59.03±15.72 years, and the highest percentage of subjects were in the age group of 40–64 years (46.3%). Regarding marital status, 71.9% were married. For educational level, 56.2% were ≥ high school. For household type and income, 89.6% were in a multi-person household, while 62.4% had an average monthly income of < 3 million won. 1.4% were disaster victims who had experienced suicidal ideation.

For disaster-related characteristics, the type of disaster with the highest percentage was earthquake (31.0%), followed by typhoon (29.0%), heavy rain (26.1%), and fire (13.9%). Furthermore, the time passed since disaster with the highest percentage was ≤ 2 years (46.0%), followed by 3–5 years (39.8%). The number of subjects without any disaster-related injury or disease was 94.3%, and most subjects (48.8%) showed a good subjective health status. For depression, anxiety, PTSD, and resilience, the mean scores were 3.42±4.54 (range 0~27), 2.45±3.52 (range 0~21), 15.66±15.46 (range 0~88), and 13.51±3.68 (range 0~24), respectively. For social support and social adjustment, the mean scores were 41.08±7.40 (range 12~60) and 8.58±4.68 (range 0~20), respectively (Table 1).

Variation in Suicidal Ideation According to Demographic Characteristics

Between the suicidal ideation and non-suicidal ideation groups, the following variables showed significant differences: household type (x^2=7.38, P=0.007), disaster-related injury or disease (x^2=30.15, P<0.001), subjective health status (x^2=9.71, P=0.008), depression (t=−11.73, P<0.001), anxiety (t=−9.08, P<0.001), PTSD (t=−5.25, P<0.001), resilience (t=2.74, P=0.006), social support (t=4.22, P<0.001), and social adjustment (t=−2.80, P=0.009). Other variables did not demonstrate any significant differences (Table 1).

Factors Influencing Suicidal Ideation

The factors influencing suicidal ideation were analyzed with the variables exhibiting significant differences in suicidal ideation (household type, disaster-related injury or disease, subjective health status, depression, anxiety, PTSD, resilience, social support and social adjustment) applied as the independent variables and suicidal ideation as the dependent

Table 1 Comparison of Suicidal Ideation According to the Subjects' Characteristics (N=2234)

Variables	Characteristics	n (%) M±SD	Suicidal Ideation		
			Yes (n=32)	No (n=2202)	x^2 or t (P)
Gender	Male	987(44.2%)	13(1.3%)	974(98.7%)	0.17 (0.683)
	Female	1247(55.8%)	19(1.5%)	1228(98.5%)	
Age (year)	19~39	324(14.5%)	2(0.6%)	322(99.4%)	5.17 (0.076)
	40~64	1034(46.3%)	21(2.0%)	1013(98.0%)	
	≥65	876(39.2%)	9(1.0%)	867(99.0%)	
Marital status	Single/divorced/widow	627(28.1%)	11(1.8%)	616(98.2%)	0.64 (0.424)
	Married	1607(71.9%)	21(1.3%)	1586(98.7%)	
Educational level	≤Middle school	978(43.8%)	14(1.4%)	964(98.6%)	0.00 (0.997)
	≥High school	1256(56.2%)	18(1.4%)	1238(98.6%)	
Household type	One-person households	233(10.4%)	8(3.4%)	225(96.6%)	7.38 (0.007)
	Multi-person households	2001(89.6%)	24(1.2%)	1977(98.8%)	
Average monthly income (million won)	<3	1395(62.4%)	24(1.7%)	1371(98.3%)	2.18 (0.140)
	≥3	839(37.6%)	8(1.0%)	831(99.0%)	
Type of disaster	Typhoon	648(29.0%)	8(1.2%)	640(98.8%)	3.90 (0.272)
	Heavy rain	584(26.1%)	12(2.1%)	572(97.9%)	
	Fire	310(13.9%)	6(1.9%)	304(98.1%)	
	Earthquake	692(31.0%)	6(0.9%)	686(99.1%)	
Time passed since disaster (years)	≤2	1027(46.0%)	13(1.3%)	1014(98.7%)	1.58 (0.455)
	3~5	889(39.8%)	12(1.3%)	877(98.7%)	
	6~7	318(14.2%)	7(2.2%)	311(97.8%)	
Disaster-related injury or disease	No	2106(94.3%)	23(1.1%)	2083(98.9%)	30.15 (<.001)
	Yes	128(5.7%)	9(7.0%)	119(93.0%)	
Subjective health status	Low	568(25.4%)	15(2.6%)	553(97.4%)	9.71 (0.008)
	Moderate	576(25.8%)	9(1.6%)	567(98.4%)	
	High	1090(48.8%)	8(0.7%)	1082(99.3%)	
Depression		3.42±4.54	12.50±7.01	3.29±4.36	−11.73 <0.001)
Anxiety		2.45±3.52	7.97±5.77	2.37±3.42	−9.08 (<.001)
PTSD		15.66±15.46	34.09±20.07	15.39±15.23	−5.25 (<.001)
Resilience		13.51±3.68	11.75±3.821	13.53±3.67	2.74 (0.006)
Social support		41.08±7.40	35.63±8.26	41.16±7.36	4.22 (<.001)
Social adjustment		8.58±4.68	11.34±5.63	8.54±4.65	−2.80 (0.009)

Table 2 Factors Associated with Suicidal Ideation (N=2234)

Variables		B	SE	Wald	OR	95% CI	*P*
Intercept		−2.64	1.55	2.92	0.07	–	0.088
Household type (ref=one-person households)		−0.07	0.52	0.02	0.93	0.34–2.55	0.888
Disaster-related injury or disease (ref=no)		−1.67	0.48	12.28	1.89	0.07–0.48	<0.001
Subjective health status (ref=low)	Moderate	0.42	0.52	0.66	1.53	0.55–4.26	0.418
	High	0.51	0.55	0.86	1.67	0.57–4.92	0.354
Depression		0.27	0.06	23.83	1.31	1.18–1.47	<0.001
Anxiety		−0.05	0.07	0.49	0.95	0.83–1.09	0.485
PTSD		0.01	0.02	0.11	1.01	0.97–1.04	0.737
Resilience		0.05	0.06	0.73	1.06	0.93–1.19	0.393
Social support		−0.06	0.02	6.67	0.94	0.90–0.99	0.010
Social adjustment		−0.05	0.04	1.23	0.95	0.88–1.04	0.267

Abbreviations: OR, odds ratio; CI, confidence interval, ref., References.

variable. The categorical variables were treated as dummies. The model derived in this study showed a Hosmer-Lemeshow statistic of 0.79, indicating an acceptable level of model fitness.

The analysis identified disaster-related injury or disease, depression, and social support as the factors influencing suicidal ideation of disaster victims. The odds ratio of suicidal ideation increased in subjects who experienced a disaster-related injury or disease compared to those who did not (OR=1.89, 95% CI=0.07–0.48). An increase in depression level resulted in an increase in the odds ratio of suicidal ideation (OR=1.31, 95% CI=1.18–1.47). Additionally, an increase in social support led to a decrease in the odds ratio of suicidal ideation (OR=0.94, 95% CI=0.90–0.99) (Table 2).

Discussion

In this study, the LSCLDV data were used to determine the factors that influence suicidal ideation in disaster victims with respect to their demographic characteristics, disaster-related characteristics, subjective health status, psychological state, and social status. Of the 2234 subjects in this study, 32 were disaster victims who had experienced suicidal ideation, accounting for 1.4%. This is slightly lower than 2.8% found in a study of earthquake victims in Japan[29] or 5.2% found in a study of adolescent victims of natural disasters in the U.S.[30] The higher percentages in these previous studies may be due to the subjects being severely affected by the disaster and residing in temporary housing for three years after the Great East Japan Earthquake[29] in Japan and being adolescents with a relatively high rate of suicidal ideation in the U.S.[30] Nonetheless, a direct comparison is difficult due to various factors, including the characteristics of the country or community in concern, age of victims, time passed since disaster, and type and severity of disaster. In Asia, Muslim countries such as Iran, Pakistan, Saudi Arabia, and Turkey reported low suicide rates of less than 6.5 per 100,000.[31] Therefore, it is necessary to monitor and compare the changes in the trends of suicidal ideation by differentiating the disaster victims according to disaster-related and national characteristics.

In this study, suicidal ideation significantly differed according to the subjects' household type; the rate of suicidal ideation was higher for one-person households than for multi-person households. This was in line with a previous study reporting a higher rate of suicidal ideation for one-person households, indicating high levels of depression and stress as well as lack of a support system owing to living alone.[32] In many countries, the increased age of marriage and geographical migration has increased the percentage of one-person households.[33] In South Korea, the percentage was 31.7% in 2021, and 36% of those living in one-person households were older adults aged 60 or above.[34] Moreover, the suicide rate in older adults aged 65 years or above is the highest at 46.6 per 100,000 population among the OECD countries.[35] Various studies reported a one-person household as the strongest factor influencing suicidal ideation.[32,36] Thus, efforts should be made by the families of those living in one-person

households to maintain and improve the relationship. Additionally, activities to increase social contact should be encouraged and social networks should be formed to help them establish a support base other than family, thereby preventing social isolation or negligence that can increase depression in one-person households.

Among the disaster-related characteristics, injury or disease due to disaster was found to be a significant factor affecting suicidal ideation in disaster victims. In other words, in the case of disaster victims who had an injury or disease due to disaster, suicidal ideation was significantly higher. In a previous study on earthquake victims, a close correlation was found between disaster-related injury and the onset of suicidal ideation.[29] As disaster-related injury or disease may lead to limitations in the physical and social activities of affected individuals, it may impact their overall mental health and cause suicidal ideation.[36] This may explain the significantly high level of suicidal ideation in subjects with low subjective health status, compared to those with moderate or high subjective health status in this study, because a chronic disease or poor health can limit daily and social activities, thus inducing suicidal ideation.[37] In the present study, the severity of disaster-related injury or disease was not assessed and only the current health status was examined, which made it difficult to identify the level of damage caused by the disaster. Therefore, a follow-up study should investigate the influence of disaster-related injury or disease according to severity and that of pre-existing physical or mental disease on victims after the disaster.

A significant variation was found between subjects with suicidal ideation and those without in terms of depression, anxiety, PTSD, and resilience. Notably, depression was a significant influencing factor of suicidal ideation of disaster victims in this study. An increase in depression level resulted in an increase in the odds ratio of suicidal ideation. A previous study found that pre-disaster mental health problems such as major depressive disorder and PTSD were the factors exhibiting the highest correlation with the risk of suicide in disaster victims.[38] With increased social awareness on the severity of psychological damage in addition to the physical damage of disaster victims, the National Center for Disaster and Trauma (NCDT) was established in 2018 in South Korea to run therapeutic programs for the recovery of and providing psychological support to disaster victims.[39] In the current situation of the prolonged COVID-19 pandemic, approximately 20% of the population of South Korea falls within the high-risk group of depression, while one in nine people exhibited suicidal ideation as of June 2021.[40] In such a situation, the public should be made aware that suicide is no longer an individual but a social problem. Additionally, mental health care services aimed at suicide prevention should be implemented, and to ensure that high-risk suicide or suicidal ideation groups receive effective treatments without financial burdens, suicide prevention centers to support disaster victims should be established.

This study found significant variations in social support and adjustment among the factors of social status between subjects with suicidal ideation and those without. In particular, an increase in social support led to a significant decrease in the odds ratio of suicidal ideation. This finding is in agreement with a previous study reporting social support as a significant factor of suicidal ideation or behaviors.[39] Following a natural disaster, victims demonstrate a change in behaviors and psychological responses in five phases—the impact phase, heroism phase, honeymoon phase, disillusionment phase, and reorganization phase. In the honeymoon phase, people cooperate actively towards the greater good and the community experiences hope and joy through collaboration; however, as this phase passes, the victims become frustrated with the allocation of resources and begin to feel injustice with an increase in suicide-related behaviors.[41] In Japan, the local government-run suicide prevention projects based on a large-scale charity fund were evaluated as effective in substantially reducing the suicide rate.[42] Similarly, the South Korean government developed the National Action Plans for Suicide Prevention (2018–2022) in 2018, wherein a division for suicide prevention policy was established by the Ministry of Health and Welfare.[43] Nonetheless, these efforts by the central and local governments as well as private organizations were assessed as inadequate.[35] As of 2018, Korea's budget for suicide prevention is about 16.8 billion won, while Japan's is about 790 billion won, about 47 times more than Korea's, and Japan's suicide prevention budget per capita is also 20 times that of South Korea.[42] To adequately support disaster victims in rehabilitation and social adjustment, each community should ensure that long-term support is provided. The Federal Emergency Management Agency (FEMA) in the US provides the Individual Assistance programs designed to support disaster survivors.[44] All impacted survivors are eligible to receive services such as sheltering, feeding, medical expenses, reunification services for adults and children, and disaster legal services. Disaster case management is to assess and address a survivor's unmet needs through a disaster recovery plan. In addition, crisis counseling and psycho-educational services are to aid survivors in recovering from the adverse reactions to disasters and to begin to rebuild their lives.[45] France also implements specific interventions according to individual and

regional characteristics in its disaster risk integral management program.[46] In Korea, it is necessary to implement a multifaceted resilience program suitable for the various needs of disaster victims to prevent suicide and recover their daily lives.

Limitations

This study has two limitations. First, the cause-effect relationship among the variables could not be identified as the data analyzed in this study were obtained in 2019 after a disaster. Therefore, it is necessary to longitudinally examine the suicidal ideation of disaster victims to determine long-term trends, and the influencing factors at each time point should be comparatively analyzed. Second, as the instrument used to measure suicidal ideation in this study included a question extracted from a tool developed by the WHO, the severity of suicidal ideation could not be determined. In the future, an instrument for extensive analysis of the frequency and severity of suicidal ideation should be developed. In addition, another limitation that was not considered when analyzing the death of a family member, the consequent guilt, which can amplify the suicidal ideation of disaster victims, as factors other than PTSD. Therefore, it is necessary to further consider the factors that directly affect the suicidal ideation of disaster victims as items separate from PTSD.

Conclusion

In this study, the factors that influence suicidal ideation in disaster victims were determined based on the key variables of demographic characteristics, disaster-related characteristics, subjective health status, psychological state, and social status. The significance of this study lies in identifying the significant influencing factors of suicidal ideation in disaster victims, which were as follows: disaster-related injury or disease, depression, and social support. The present study's findings are anticipated to contribute to screening high-risk groups of suicidal ideation and developing effective support, interventions, and suicide prevention programs for disaster victims. Furthermore, to prevent suicide and promote the healthy recovery of disaster victims, mental health care services aimed at suicide prevention should be reinforced and the victims should be provided with psychological support and treatment without financial burden. For this purpose, it is highly recommended that communities take active interest in disaster victims and provide them with government support.

Abbreviations

BRS, Brief Resilience Scale; CIDI, Composite International Diagnostic Interview; ES-R, Impact of Event Scale-Revised; GAD-7, Generalized Anxiety Disorder-7 scale; LSCLDV, change of life of disaster victims; NCDT, National Center for Disaster and Trauma; NDMI, National Disaster Management Research Institute; OECD, Organisation for Economic Co-operation and Development; PTSD, posttraumatic stress disorder; PHQ-9, Patient Health Questionnaire-9; WHO, World Health Organization.

Data Sharing Statement

The data that support the findings of this study are available from National Disaster Management Research Institute but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of National Disaster Management Research Institute.

Ethics Approval and Informed Consent

Approval for the use of secondary data was obtained from the Institutional Review Board of the author's university (No. KNU-2021-0022). The NDMI obtained consent from disaster victims who wanted to voluntarily participate in the survey and provided rewards to the survey participants. In order to improve academic research and policy utilization through this survey, the NDMI deleted the subject's personal information and provided it as open data. As this study was a secondary data analysis study, additional consent was not required. This study was carried out in accordance with the Declaration of Helsinki. Ethical issues—including plagiarism, informed consent, privacy and confidentiality protection, misconduct, data fabrication and falsification, double publication and submission, and redundancy—have been thoroughly checked by the authors.

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Author Contributions

YK performed conceptualization, methodology, analysis, investigation, data curation, writing original draft, project administration and funding acquisition. EL performed conceptualization, methodology, writing and editing. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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