



Research article

The characteristics and effects of suicide attempters' suicidality levels in gender differences

Eun Kim ^a, Hye Jin Kim ^b, Duk Hee Lee ^{c,*}^a Department of Emergency Medicine, Ewha Womans University Seoul Hospital, Seoul, South Korea^b Department of Emergency Medicine, Inje University Sanggye Paik Hospital, Seoul, South Korea^c Department of Emergency Medicine, Ewha Womans University Mokdong Hospital, Seoul, South Korea

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ABSTRACT

Objective: The causal reasons for gender differences in suicide attempt and suicide death have been addressed by previous studies: Some emphasized suicidal intent, while others focused on method lethality. The present study is to examine the effects of suicidality levels defined as severity of intent *and* method lethality on gender differences.

Methods: The data were collected through Korea Foundation for Suicide Prevention (KFSP). Trained interviewers categorized a total of 1,269 patients' responses to questions regarding death wishes and the chosen methods: 1) severe (29.1%), 2) moderate (31.3%), and 3) mild (39.6%), and looked into their characteristics and risk factors related to gender.

Results: The severe group showed no gender differences in the choice of lethal methods, that is 59.4% men and 46.9% women used fatal methods such as hanging or chemical poisoning ($p = 0.075$). In contrast, moderate and mild groups showed gender differences ($p = 0.001$, respectively). Most women in the moderate group chose drug poisoning (69.1%) rather than hanging (1.0%) or pesticide poisoning (3.9%). The mild group showed similar results.

Conclusion: The present study examined the contrasting effects of suicidality levels on gender differences in suicide attempts: The severe group fail to reach significant differences, whereas the other two groups did. The future study on suicide attempt should be focused on the severe group whose characteristics were much *closer* to the actual suicide. The present findings have useful implications for gender-free prevention program.

1. Introduction

Men have a higher rate of suicide than women. The male-to-female ratio of suicide death is 2.6 in South Korea compared to 4.0 in Europe [1,2]. However, women have higher rates of attempted suicide than men. Eighty percent of successful suicides were by men, whereas women comprise a majority of attempted suicides [3]. A similar trend was observed in emergency departments (EDs) in South Korea, 55.7% of attempted suicide patients were women [2].

Gender differences in suicide attempt and suicide death have been addressed by many studies as being due to different socialization of beliefs and behaviors for men and women, male preferences for lethal methods, gender-related mental disorders such as depression and alcoholism, and a report on the bias for suicide [3–6]. The socialization explanation received mixed support [7]. Though

* Corresponding author.

E-mail address: calla@ewha.ac.kr (D.H. Lee).

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gender-specific genetic effects on depression have been reported [8], the evidence is not yet conclusive [9]. It is widely known that depression is related to suicidal ideation, and that it is not a predictor of suicidal attempts [10–13]. On the other hand, gender-specific neurobiological dysfunction [14] and immune-inflammatory abnormalities merit further examination of severe depression and its resistant to treatment [15,16]. The explanation of the suicide report bias has not received much empirical scrutiny. Only the lethality explanation survived criticism when examined for gender differences regarding suicide attempt and suicide death [17,18].

A review of 44 studies on suicidal intent, lethality, and outcomes showed variable definitions of intent, measurements, and empirical findings [19]. For instance, patients with severe suicide intent in Beck's scale chose lethal methods such as hanging and jumping [13]. A small sample size, however, did not allow analysis of gender difference in this study. Men were more serious in suicidal intent and in the choice of method than women [18]. A European multi-national study showed that men were rated more serious intent than women, while women were rated less serious as in parasuicide [7]. These and other studies assumed that men and women are different in the severity of lethal intent. Women are of less lethal intent than men, which should result in prevailing gender-specific differences in attempted and complete suicide.

What if women were similar to men in suicidal severity, would gender differences disappear in the choice of lethal methods? This issue has never been addressed in previous research. A national survey study in America examined lifelong prevalence of suicidal ideation, plan, and attempt [20]. One notable finding concerns a high conditional probability of plan (58%), even with 13.5% ideation and 3% plan. A similar conditional probability (60%) was reported in a cross national study [21]. Such, if one has severe intent, one's plan is likely to include lethal means. Increased conditional probabilities are the mechanism of intent lethality. Similar number of South Korean males and females choose hanging as a primary lethal method [22].

The level of suicidality can be defined by the pairing of patients' intent with chosen method. The intent severity hypothesis in the present study predicts the absence of gender difference when patients chose lethal methods. The presence of gender difference is expected when patients chose non-lethal means such as drug intoxication.

1.1. Study aims

The present study aims 1) to find out whether suicide attempters are categorized in terms of their level of suicidality, 2) to explore which non-lethal or lethal means are associated with a given intent, 3) to examine whether patients at a certain level show gender differences, and 4) to identify a set of risk factors of each suicidality. Our results not only validate the intent severity hypothesis but also provide empirical ground upon which gender-specific and independent risk factors can be further explored.

2. Materials and methods

2.1. Data collection

The data were collected through the Korea Foundation for Suicide Prevention (KFSP). One of the ongoing KFSP programs is to prevent suicide reattempts of patients who visited an ED with a suicide attempt. This program has been carried out in 52 EDs nationwide, each of which had two to three interviewers who were either certified nurses, social workers, or clinical psychologists. The program encourages suicide attempters to participate in an intervention program.

This study was conducted at one tertiary teaching hospital from March 2017 to May 2020. The interviewers collected data from patients for intervention but were not involved in the present study, limiting bias. When a suicide attempter is taken to an ED, the physician consults with a psychiatric resident. After discharged from the hospital, the patient and family members, if applicable, are

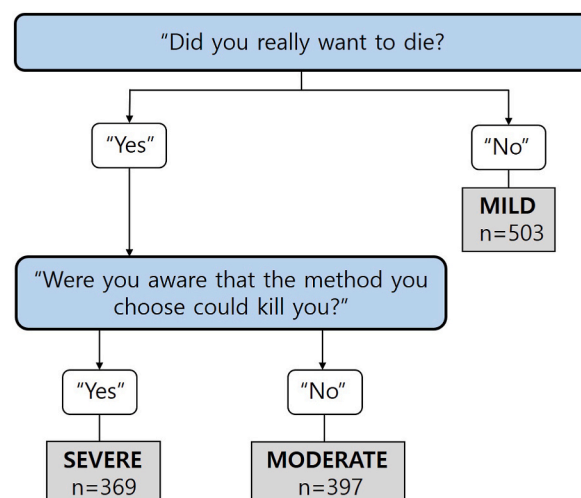


Fig. 1. Severity of suicidality.

introduced to the intervention program, during which the interviewer calls the patient once a week for four weeks. The interviewer evaluates the patient by asking the circumstances of the suicide episode. It includes basic sociodemographic factors of age (≥ 19 years old), gender, marital status, and employment status; and suicide-related factors of suicidality, method, place, motives, alcohol consumption, previous suicide attempt history, medical severity of the suicide attempt, and consent for the intervention program.

2.2. Measures

2.2.1. Suicide methods

The methods were grouped into six categories: 1) drug poisoning; 2) self-injury, that is, cutting oneself with sharp objects (e.g., wrist lacerations); 3) pesticide, gassing, or chemical poisoning; 4) hanging, drowning, or jumping from a height; 5) a combination of methods, and 6) others. Sixty-six (5.2%) cases used a combination of methods, all of which combined drug poisoning with another methods (e.g., self-injury, hanging, drowning, chemical poisoning).

2.2.2. Severity of suicidality

The interviewer asked the patient about suicidality based on the questions shown in Fig. 1. “Did you really want to die? Or did you want to get some help?” When a patient answered that he or she really wanted to die, the interviewer asked, “were you aware that the method you choose could kill you?” These questions may require attempters to be explicit in the intensity of intent and expectation of lethality of method. Answers to these questions were categorized as one of the following groups: 1) those who really wanted to die and chose the right method to do it, the *severe* group; 2) really wanted to die but did not choose the right method to do it, the *moderate* group; 3) wanted to show that they needed help and did not really want to die, the *mild* group; 4) unknown; and 5) others. The present study excluded the unknown and others categories because of a lack of information.

Based on each patients’ response to these questions, 369 (29.1%), 397 (31.3%), and 503 (39.6%) patients were included in the severe, moderate and mild groups, respectively.

2.2.3. Medical severity of suicide attempt

The medical severity of the suicide attempt was grouped into three categories: 1) minor to moderate physical damage that needs medical attention, mild to moderate; 2) severe physical damage that needs admission to a general ward (GW) or intensive care unit (ICU), severe; and 3) deceased.

2.3. Statistical analysis

The categorical variables were analyzed using the chi-square test, while Student’s *t*-test was used for continuous variables. Gender differences in basic sociodemographic factors and suicide attempt patterns were analyzed by the chi-square test and Student’s *t*-test. The chi-square test was also used to analyze the association between suicide method and gender in the three suicidality groups. Finally, binary logistic regression analysis was used to evaluate the impacts of the independent variables on each of the three suicidality groups. Statistical significance was set at $p < 0.05$. All statistical analyses were performed using IBM® SPSS® Statistics version 26.0.

2.4. Ethics statement

This study was reviewed and approved by the Institutional Review Board and Ethics Committee of Ewha Womans University, College of Medicine (No. 2021-03-040). The informed consent was not obtained, because the data were analyzed anonymously.

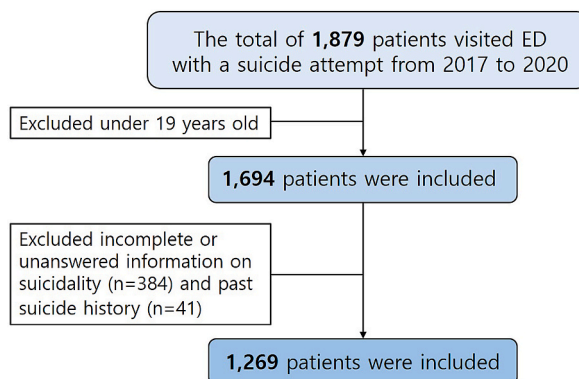


Fig. 2. Case selection flow.

3. Results

3.1. Basic sociodemographic factors and information on suicide attempt

Data on a total of 1,269 patients were collected as shown in Fig. 2. The present study was focused on patients' suicidality; we excluded all incomplete or unanswered cases. The basic demographic factors are shown in Table 1. There were 407 (32.1%) men and 862 (67.9%) women. The women were significantly younger (38.7 ± 16.9 years old) than the men (46.8 ± 19.3 years) ($p < 0.001$). When we grouped patients into three age groups, 46.7% of men were older than 46 years, whereas 40.4% of women were 19–29 years old ($p < 0.001$). More men (37.3%) were unemployed than women (22.9%).

Reattempts occurred with 44.9% of the women, whereas 31.7% of the men reattempted, a statistically significant difference ($p < 0.001$). When comparing suicidality between genders, more men were in the severe group (45.9%), while most women were in the moderate (35.7%) or mild (43.2%) group. Men chose more violent and fatal methods such as hanging or jumping from a height

Table 1
Relationships between basic sociodemographic factors and information on suicide attempt by gender.

Factors	Total, n	Male	Female	P value
		n = 407	n = 862	
Age (mean \pm SD)	1,269	46.8 \pm 19.3	38.7 \pm 16.9	<0.001*
Age group				<0.001**
19–29 years	452 (35.6)	104 (25.6)	348 (40.4)	
30–45 years	355 (28.0)	113 (27.8)	242 (28.1)	
\geq 46 years	462 (36.4)	190 (46.7)	272 (31.6)	
Marital status				0.029
Single	537 (42.3)	161 (39.6)	376 (43.6)	
Married	419 (33.0)	147 (36.1)	272 (31.6)	
Divorced	75 (5.9)	22 (5.4)	53 (6.1)	
Widowed	34 (2.7)	4 (1.0)	30 (3.5)	
Others ^a	204 (16.1)	73 (17.9)	131 (15.2)	
Profession				<0.001
Employed	354 (27.9)	112 (27.5)	242 (28.1)	
Student	93 (7.3)	20 (4.9)	73 (8.5)	
Housewife	122 (9.6)	0 (0.0)	122 (14.2)	
Unemployed	349 (27.5)	152 (37.3)	197 (22.9)	
Others	351 (27.7)	123 (30.2)	228 (26.5)	
Prior suicide attempt				<0.001
No	753 (59.3)	278 (68.3)	475 (55.1)	
Yes	516 (40.7)	129 (31.7)	387 (44.9)	
Suicidality				<0.001
Severe	369 (29.1)	187 (45.9)	182 (21.1)	
Moderate	397 (31.3)	89 (21.9)	308 (35.7)	
Mild	503 (39.6)	131 (32.2)	372 (43.2)	
Suicide attempt method				<0.001
Drug poisoning	673 (53.0)	163 (40.0)	510 (59.2)	
Self-injury	232 (18.3)	62 (15.2)	170 (19.7)	
Hanging, drowning, falling	152 (12.0)	82 (20.1)	70 (8.1)	
Pesticide, gas, chemical poisoning	115 (9.1)	65 (16.0)	50 (5.8)	
Combination of methods	66 (5.2)	21 (5.2)	45 (5.2)	
Others	31 (2.4)	14 (3.4)	17 (2.0)	
Suicide attempt place				<0.001
Home	1,090 (85.9)	314 (77.1)	776 (90.0)	
Vehicle	10 (0.8)	7 (1.7)	3 (0.3)	
Outdoors	63 (5.0)	33 (8.1)	30 (3.5)	
School or workplace	9 (0.7)	3 (0.7)	6 (0.7)	
Communal living	42 (3.3)	22 (5.4)	20 (2.3)	
Commercial facility	35 (2.8)	17 (4.2)	18 (2.1)	
Others	20 (1.6)	11 (2.7)	9 (1.0)	
Alcohol consumption				0.409
No	701 (55.2)	218 (53.6)	483 (56.0)	
Yes	568 (44.8)	189 (46.4)	379 (44.0)	
Medical severity				<0.001
Mild to moderate	861 (67.8)	232 (57.0)	629 (73.0)	
Severe	375 (29.6)	154 (37.8)	221 (25.6)	
Deceased	33 (2.6)	21 (5.2)	12 (1.4)	

Values are mean \pm SD, or number (%).

Abbreviation: SD, standard deviation.

* Student's *t*-test was used for continuous variables.

** Chi-square test was used for categorical variables.

^a 'Others' category included separation, live together or patient who did not verify his/her marital status.

(20.1%) than women (8.1%). Men (16.0%) also chose pesticide, gas, and chemical poisoning more than women (5.8%). For this reason, men were in a more medically severe status (37.8%) and had more fatal (5.2%) outcomes compared to women (25.6% and 1.4%, respectively). In contrast, drug poisoning (59.2%) was the most common suicide method for women. Even though many men chose drug poisoning (40.0%) as a suicide method, the proportion was less than that for women. Women experienced medically mild to moderate (73.0%) outcomes compared to men (57.0%). Drinking was not statistically significant ($p = 0.409$) in either gender (men 46.4% vs. women 44.0%). When the patients or their families were asked if they agreed to a phone intervention for prevention, 27.8% of men and 30.7% of women or their families agreed ($p = 0.279$).

3.2. Suicide motives

The association of motives by gender was analyzed, and the results are shown in Table 2. Women (33.3%) had more relationship problems than men (25.1%), whereas men (11.8%) had more financial problems than women (7.1%). Both factors were statistically significantly different between genders ($p = 0.003$ and $p = 0.005$, respectively). Physical illness was more problematic for men (11.5%) than women (6.1%). Other motives such as problems at the workplace, social relationship, loneliness, and legal problems were not statistically significant in either gender.

3.3. Binary logistic regression analysis of three suicidality group

Table 3 presents a summary of the binary logistic regression analysis of the influence of gender, age, prior suicide attempt, method, and intervention for each suicidality group. This analysis explained between 14.1% and 44.3% of the total variance.

Men had significantly higher odds of being in the severe group (odds ratio [OR] = 1.95; $p < 0.001$) significantly lower odds of being in the moderate (OR = 0.77; $p = 0.091$) or mild group (OR = 0.77; $p = 0.064$). A patient older than 46 years was significantly more likely to be in the severe group (OR = 3.88; $p < 0.001$). If a patient had a prior suicide attempt history, their odds of being rated in the moderate group were significantly high (OR = 2.16; $p < 0.001$). If a patient chose hanging (OR = 28.12; $p < 0.001$), pesticide (OR = 6.39; $p < 0.001$), or a combination of methods (OR = 5.36; $p < 0.001$) as their suicide method, they had high odds of being rated in the severe group. However, if a patient chose self-injury (OR = 1.57; $p = 0.005$), they would significantly more likely to be in the mild group. If a patient agreed to the intervention program, the odds that they were rated in the moderate group (OR = 1.32; $p = 0.047$)

Table 2
Differences in suicide motive by gender.

Suicide Motivation	Total, n (%)	Male	Female	P value
		n = 407	n = 862	
Mental disorder				0.024
No	192 (15.1)	75 (18.4)	117 (13.6)	
Yes	1,077 (84.9)	332 (81.6)	745 (86.4)	
Problems with relationship				0.003
No	880 (69.3)	305 (74.9)	575 (66.7)	
Yes	389 (30.7)	102 (25.1)	287 (33.3)	
Problems at school or work				0.191
No	1,134 (89.4)	357 (87.7)	777 (90.1)	
Yes	135 (10.6)	50 (12.3)	85 (9.9)	
Financial problem				0.005
No	1,160 (91.4)	359 (88.2)	801 (92.9)	
Yes	109 (8.6)	48 (11.8)	61 (7.1)	
Arguing, fighting, or being punished				0.057
No	1,088 (85.7)	360 (88.5)	728 (84.5)	
Yes	181 (14.3)	47 (11.5)	134 (15.5)	
Physical illness				0.001
No	1,169 (92.1)	360 (88.5)	809 (93.9)	
Yes	100 (7.9)	47 (11.5)	53 (6.1)	
Traumatic event				0.096
No	1,214 (95.7)	395 (97.1)	819 (95.0)	
Yes	55 (4.3)	12 (2.9)	43 (5.0)	
Death or sickness of someone close				0.423
No	1,238 (97.6)	395 (97.1)	843 (97.8)	
Yes	31 (2.4)	12 (2.9)	19 (2.2)	
Loneliness				0.083
No	1,249 (98.4)	397 (97.5)	852 (98.8)	
Yes	20 (1.6)	10 (2.5)	10 (1.2)	
Abuse or harassment				0.006
No	1,253 (98.7)	407 (100.0)	846 (98.1)	
Yes	16 (1.3)	0 (0.0)	16 (1.9)	
Legal problem				0.101
No	1,251 (98.6)	398 (97.8)	853 (99.0)	
Yes	18 (1.4)	9 (2.2)	9 (1.0)	

Table 3
Binary logistic regression analysis of clinical and suicide factors in suicidality group.

Suicidality	Independent variables	OR	95% CI for the OR	P value	Nagelkerke R ²
Severe group					0.443
Really wanted to kill myself and chose the right method					
	Gender				
	Male	1.95	1.42–2.69	<0.001	
	Age				
	19–29 years	Ref			
	30–45 years	1.49	0.96–2.31	0.073	
	≥46 years	3.88	2.58–5.85	<0.001	
	Prior suicide attempt				
	Yes	0.57	0.40–0.80	0.001	
	Suicide attempt method ^a				
	Drug poisoning	Ref			
	Self-injury	0.71	0.43–1.17	0.179	
	Hanging, drowning, falling	28.12	16.83–46.98	<0.001	
	Pesticide, gas, chemical poisoning	6.39	4.00–10.22	<0.001	
	Combination of methods	5.36	2.96–9.70	<0.001	
	Intervention				
	Agreed	0.46	0.32–0.66	<0.001	
Moderate group					0.156
Really wanted to kill myself but did not choose the right method					
	Gender				
	Male	0.77	0.57–1.04	0.091	
	Age				
	19–29 years	Ref			
	30–45 years	0.8	0.58–1.10	0.172	
	≥46 years	0.65	0.47–0.90	0.008	
	Prior suicide attempt				
	Yes	2.16	1.65–2.83	<0.001	
	Suicide attempt method				
	Drug poisoning	Ref			
	Self-injury	0.67	0.47–0.93	0.016	
	Hanging, drowning, falling	0.11	0.05–0.22	<0.001	
	Pesticide, gas, chemical poisoning	0.42	0.25–0.69	0.001	
	Combination of methods	0.63	0.36–1.10	0.101	
	Intervention				
	Agreed	1.32	1.00–1.74	0.047	
Mild group					0.141
Wanted help but not to die					
	Gender				
	Male	0.77	0.58–1.02	0.064	
	Age				
	19–29 years	Ref			
	30–45 years	1.07	0.78–1.46	0.676	
	≥46 years	0.63	0.46–0.85	0.003	
	Prior suicide attempt				
	Yes	0.67	0.52–0.88	0.003	
	Suicide attempt method				
	Drug poisoning	Ref			
	Self-injury	1.57	1.14–2.15	0.005	
	Hanging, drowning, falling	0.16	0.10–0.28	<0.001	
	Pesticide, gas, chemical poisoning	0.39	0.24–0.63	<0.001	
	Combination of methods	0.45	0.25–0.80	0.006	
	Intervention				
	Agreed	1.17	0.90–1.53	0.236	

Abbreviations: CI, confidence interval; OR, odds ratio; Ref, reference group.

^a ‘Others’ category in suicide methods was excluded.

were high.

In general, these results suggested that serious suicide attempts of the severe group were characterized by high rates of older age, men, and notably high rates of lethal methods. The results of moderate and mild groups were different: Higher rates of past suicide history and of being agreed to intervention program for moderate and higher rate of self-injury for the mild group.

3.4. Association between suicidality group and gender

As shown in Table 4, we examined the association between suicidality and method by gender. Among the six suicide methods in Table 1, the “other” category was excluded from the analysis because of the small number. About half of men (59.4%) and women

Table 4
The association between suicidality and method^a by gender.

Suicidality	Gender	Total, n (%)	Drug poisoning	Self-injury	Hanging, drowning, falling	Pesticide, gas, chemical poisoning	Combination of methods	P Value
Severe (n = 364)	Men	185 (100)	51 (27.6)	14 (7.6)	70 (37.8)	40 (21.6)	10 (5.4)	0.075
	Women	179 (100)	68 (38.0)	10 (5.6)	56 (31.3)	28 (15.6)	17 (9.5)	
Moderate (n = 393)	Men	89 (100)	48 (53.9)	19 (21.3)	6 (6.7)	10 (11.2)	6 (6.7)	0.001
	Women	304 (100)	210 (69.1)	63 (20.7)	3 (1.0)	12 (3.9)	16 (5.3)	
Mild (n = 481)	Men	119 (100)	64 (53.8)	29 (24.4)	6 (5.0)	15 (12.6)	5 (4.2)	0.001
	Women	362 (100)	232 (64.1)	97 (26.8)	11 (3.0)	10 (2.8)	12 (3.3)	

Values are number (%).

^a 'Others' category in suicide methods was excluded.

(46.7%) in the severe group used fatal methods (e.g., hanging or chemical poisoning). Also, notice that a small number of women with severe intent (38%) preferred drug poisoning. The gender difference in the severe group was statistically significant ($X^2(4, N = 364) = 8.49, p = 0.075$). In contrast, the moderate and the mild group showed quite different preferences of suicide methods. Majority of these patients chose non-lethal methods (e.g., drug poisoning or self-injury). More women chose non-lethal methods than men did (69.1% vs. 53.9%, 64.1% vs. 53.8%). Both groups confirmed significant gender differences ($X^2(4, N = 393) = 16.95, p = 0.001$; $X^2(4, N = 481) = 17.39, p = 0.001$). These findings suggest that gender differences may emerge from lethal intent and plan. When many women with severe intent use lethal methods, gender effects become negligible in suicide attempts.

4. Discussion

Based on high conditional probability of suicide plan, the present study found that the gender differences were greatly dependent upon the suicidality levels. Though the moderate and the mild groups differ in their suicidal intent, patients in both groups chose less lethal methods.

In a binary logistic regression analysis, the severe group's suicidal behavior was explained by a set of five factors: age, gender, prior suicide attempt, methods, and intervention. This result suggests that a future study with a larger sample should consider not only suicidal intent and method, but also age and prior suicide attempt.

5. Limitation

Because of the difficulty in collecting follow-up data regarding the participants in the present study, we were not able to examine how many patients in each group have actually reattempted suicide after the study period. On the basis of the results in Table 3, we would expect more suicide reattempts in the moderate group than in other groups. This group has a strong suicidal intent as indicated in their prior suicide attempts. For this reason, a suicide prevention program should be focused on the moderate group.

We were also concerned with limited information regarding patients' past and present suicide behavior. This might be partly due to insurance problems and patients' unwillingness to report their psychiatric history. The opportunity to examine the role of suicidal intent associated with the lethal methods might have been under-valued. With these limitations, our definition of suicidality based on suicidal intent and the chosen method satisfies Hawton's proposal: The severe group's intent adequately associated with the use of lethal methods indicates that unlike other groups, they were quite closer to the actual suicides [23]. In this sense, the severe group is at high risk for lethal attempt.

The patients who already died by suicide at the scene were not transported to the ED and so were not included in the present study. However, it is important to investigate these patients using a psychological autopsy. Because it can provide crucial information about the objective suicide circumstances and a better understanding of the death. A psychological autopsy can provide information that can help to develop a useful suicide prevention program [24].

6. Implications of the present study

Our findings have significant implications for research on theoretical and practical issues of gender differences which have been a focal issue of suicide studies. Common risk factors, that is, lethal intent must be identified considering both genders; such a change would reduce the number of risk factors to be manageable for treatments and prevention. If the absence of gender difference in the severe group are replicated in a future study, a gender-free and gender-specific suicide prevention program should then be considered. Future research should examine the nature of suicide planning that shows a relationship between suicide intent and method.

The present study calls for caution when sampling patients with severe intent but using less lethal methods. We might have inadvertently reduced gender differences by including such patients in the severe group (Table 4). Also, a question should be raised about whether severe group patients who used drug poisoning were similar to moderate group patients who used the same method.

Because the suicidal intent of the two groups was similar, they would have the same degree of method lethality. This could be examined in a future study because all three groups chose drug poisoning with a different proportion of patients. Probably, even with the same drug poisoning, the three groups might differ in terms of lethal dose.

If a diagnosis regarding lethal intent were provided by psychological autopsy, an intensive program should be developed to reduce suicide reattempts. The severe group patients who chose a lethal method are highly likely to reattempt in the future, because the whole process of ideation, planning, and action were already performed. Unless drastic changes occur in their circumstances, they are very likely to reattempt with more lethal method [25]. If a person is in the moderate group, it is necessary to help him/her not to fall into having lethal intent. Our study shows that only the moderate group is willing to ask for help of an intervention program (Table 3).

7. Conclusion

We examined the gender difference in the intimate relationship between suicidal intent and the chosen method. This new perspective allowed us to emphasize the association between the two, and we were able to categorize suicidality into three groups of severe, moderate, and mild. We found the absence of gender difference in the severe group and a persistent difference in the other two groups. These findings led us to conclude that the gender differences in suicidality might not be robust. A set of two questions for categorizing suicidality proved to be quite useful in examining the characteristic and effects of suicidal intent adequately associated with lethal methods. Future work should be done to assess patients' lethal intent in more detailed such as psychological autopsy.

Author contribution statement

Eun Kim: Conceived and designed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Hye Jin Kim: Performed the experiments; Contributed reagents, materials, analysis tools or data.

Duk Hee Lee: Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Data availability statement

Data will be made available on request.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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