

The Relationship Between Impulsivity and Suicidal Risk of University Student's : The Moderating Effects of Empathy Ability

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Abstract: The purpose of this study are to examine the moderating effect of empathy ability as moderator variable in order to know how much university student's difficulties in impulsivity would influence on suicidal risk. To this end, a study was conducted on 772 students attending universities located in Daegu and Gyeongbuk. For the research analysis, the three-step control regression analysis proposed by Baron and Kenny(1986) was used. The research results are as follows. First, analysis showed that the moderating effect of empathy ability in the relationship between impulsivity and suicidal risk is significant. The higher the empathy ability, the lower the impact of impulsivity on suicidal risk. Second, Empathy ability was shown to control the impact of impulsivity on the suicidal risk sub-factor. The details are as follows. Empathy ability was found to moderated the influence of impulsivity on negative self-assessment, suicidal ideation, and hopelessness. The higher the empathy ability, the lower the impact of impulsivity on negative self-assessment, suicidal ideation, and hopelessness. In conclusion, this study confirm the important role of empathy ability to reduce suicidal risk and provide basic data for counseling and psychotherapy.

Keywords: Suicidal risk, Impulsivity, Empathy Ability, Moderating effect

1. Introduction

University students' psychiatric disease and suicide problem are showing an increasing trend day by day because of interpersonal relationship, employment stress and economic difficulty. According to the report data regarding suicide rate by age group for 2019 in the Ministry of Health and Welfare, the suicide rate is diminishing in all age groups[1]. On the other hand, it was indicated that the suicide rate is not decreasing in their 20s. The suicide rate in their 20s of South Korea stands at 16.4 people, thereby being higher by 1.6 times than the average of OECD(Organization for Economic Cooperation and Development) countries. In this respect, a separate suicide prevention measure for undergraduates is in the real situation of being imminent above all. Kim[2] who carried out a research on a relevant factor of causing university students' suicidal ideation reported that a factor of affecting suicidal behavior includes the psycho-emotional problem, the interpersonal problem, the learning and career problems. Especially, the psycho-emotional problems such as depression, anxiety, impulsivity and cognitive vulnerability are being classified into risk factors of predicting suicidal behavior[3]. Wanget al.[4] who examined a psychiatric characteristic in university students of attempting suicide due to a psycho-emotional problem reported that risk-seeking behavior, namely, individual impulsivity, has the closest relationship with suicidal behavior.

Impulsivity implies a tendency of responding speedily and indiscriminately to internal or external stimulation without considering a negative outcome available for inflicting on oneself or others[5]. The research by Benderetal.[6] targeting university students shows a tendency in which the undergraduates with impulsive behavior have the high acquired capability for suicide. Thus, there is a suggestion that the approach for lowering an individual's impulsivity is needed. It is not that an impulsive person certainly attempts impulsive suicide. But people with the impulsive behavior leads to the high possibility for a plan and a risk of suicide attempt, and for a fatal suicide attempt[7]. Thus, this study is aimed to examine impulsivity in university students as a causal variable for a suicidal risk.

Targeting people who escaped from a risk of suicide, Bostik and Everall[8] carried out the exploration on a plan for overcoming this. As a result, a change in the perception of a relationship was clarified to be possibly cured. The happening of a change in negative self-awareness on oneself through positive experience in a relationship leads to coming to free from the danger of suicide[9]. Mueller and Waas[10] proposed the necessity of enhancing interpersonal relationship as a plan for lessening university students' suicide problem. As the most important element for the improvement in personal relations, the empathy ability was reported to be very crucial. Through these previous researches, the empathy ability level that university students have can be found to be very significant as a way to reduce a suicidal risk[11]. Also a person with the higher empathy ability may show the lower impulse problem compared to people who have low empathy level[12]. In this regard, a causality between two variables needs to be examined. Accordingly, this study is intended to inquire into whether a difference is indicated in impulsivity according to university students' empathy ability level.

Synthesizing the results of previous researches, people's impulsivity and suicidal risk can be known to be possibly changed depending on empathy ability level. Undergraduates' impulsivity can be known to function as a causal variable of raising their suicide risk. A research by Soloff et al.[13] stated that a change in individual empathy ability can act as a factor of dropping aggression and suicide attempt including their impulsivity is signifying the necessity of inspecting the moderating effect of empathy ability. Hence, this study aimed to check the moderating effect of empathy ability in a relationship between impulsivity and suicide risk after selecting empathy ability as a variable for changing the influence of impulsivity upon a suicidal risk. Also, the existing researches relevant to impulsivity and suicide are in the real situation of being hardly performed. A research targeting adolescents is being mainly carried out in the country. Therefore, this study is intended to progress a research for bringing down the suicidal risk of university students who are exposed to a lot of stress.

Examining the existing research related to suicide, it is dominated by a research that seeks for a risk factor through the clinical experience or the community survey work. However, this case may be shown a great difference depending on a clinician's subjective judgment and individual ability. Thus, this study is aimed to seek a method for preventing university students' suicide-related problem through applying the suicide risk scale that even non-experts can fully use and effectively predict suicidality. Furthermore, this study inquires into a causality among variables through dividing a suicide risk into four dimensions, thereby having a great significance in securing basic data in relation to suicide. Based on the previous research, this study established the research problem as "what about the moderating effect of empathy ability in the influence of undergraduates' impulsivity upon a suicidal risk?"

2. Research Method

2.1. Participants And Place

To conduct this study, a questionnaire survey was carried out targeting students who are attending universities located in Daegu and Gyeongbuk. Excluding students who gave insincere response or refused to disclose information among 793 people who participated in the questionnaire survey, 772 participants were finally selected of which 324 or 42% are male while 448 or 58% are female. The school year was indicated of which 241 or 31.2% are freshman while 196 or 25.4% are sophomore, 184 or 23.8% are junior, 151 or 19.6% are senior. The major was shown to be 290 or 37.6% are humanities science while 184 or 23.8% are social science, 143 or 18.5% are science subjects, 73 or 9.5% are science & engineering, 82 or 10.6% are others.

2.2. Research Tools

2.2.1. Suicidal Risk

To measure a suicidal risk, this study used the scale that Kim and Lee[14] adapted, modified and supplemented through applying the suicide probability scale that Cull and Gill[15] developed. The sub-factors of this scale comprise negative self-assessment, suicidal ideation, hopelessness, and hostility factor. The item-based response mode consists of a 4-point likert scale. The use of average value as for each item implies that the higher average mean leads to the higher suicidal risk. As a result of analyzing reliability among items, it was indicated to be negative self-assessment with .735, suicidal ideation with .700, hopelessness with .782, and hostility with .577.

2.2.2. Impulsivity

To gauge impulsivity, this study used NEO-II personality test that Ahn and Ahn[16] standardized Big 5 Personality Scale, which was developed by Costa and McCrae[17]. This scale is composed of extroversion, openness, affinity, sincerity, neurosis. Still, this study used an impulsive factor of neurosis. The research analysis was applied the standardized T-score. It implies that the higher average value leads to the higher impulsivity.

2.2.3. Empathy Ability

To measure empathy ability, this study used the scale that Park[18] adapted, modified and supplemented the interpersonal reaction tool, which was developed by Davis[19]. The sub-factors of this study consist of cognitive empathy and emotional empathy. The item-based response mode comprises a 4-point likert scale. The use of average value as for each item implies that the higher average mean leads to the higher empathy ability. In consequence of analyzing reliability among items, it was shown to be cognitive empathy with .745 and emotional empathy with .726.

2.3. Research Analysis Method

For the data analysis of this study, the statistical analysis was carried out as follows by using SPSS 18.0 program. First, to inquire into a variable-based relationship, a correlation analysis was implemented. Second, to look into a moderating effect of empathy ability in the influence of impulsivity upon a suicidal risk, the 3-step moderated regression analysis that Baron and Kenny[20] presented was executed. To grasp whether the form of a moderating variable is pure or quasi moderating variable, the analysis was carried out by applying a method of distinguishing a moderating variable that Sharma, Durand and Gur-Arie[21] suggested. the pure moderator means

that the moderator variable does not affect the dependent variable, and the quasi moderator means the moderator variable affects the dependent variable.

3. Result

3.1. A Correlation Among Suicidal Risk, Empathy Ability And Impulsivity

As a result of examining a correlation among suicidal risk, empathy ability and impulsivity in university students, first, the whole and sub-factors of suicidal risk are showing a significant negative correlation with the whole and sub-factors of empathy ability($r=-.20\sim-.42, p<.05$). Second, the remaining factors excluding hostility factor($r=.03, p>.05$) out of sub-factors in suicidal risk are indicating a significant positive correlation with impulsivity factor($r=.28\sim.43, p<.05$). Third, all the whole and sub-factors of empathy ability are representing a significant negative correlation with impulsivity factor($r=-.16\sim-.24, p<.05$).

Table 1. The relationship between Suicidal risk, Empathy ability, and Impulsivity

| | 1 | 1-1 | 1-2 | 1-3 | 1-4 | 2 | 2-1 | 2-2 | 3 | |
|-----------------|-----|-------|-------|-------|-------|-------|-------|-------|-------|---|
| 1 | 1 | | | | | | | | | |
| Suicidal risk | 1-1 | .83* | 1 | | | | | | | |
| | 1-2 | .84* | .68* | 1 | | | | | | |
| | 1-3 | .85* | .64* | .61* | 1 | | | | | |
| | 1-4 | .78* | .51* | .49* | .52* | 1 | | | | |
| Empathy ability | 2 | -.40* | -.35* | -.39* | -.31* | -.26* | 1 | | | |
| | 2-1 | -.42* | -.40* | -.38* | -.33* | -.28* | .89* | 1 | | |
| | 2-2 | -.30* | -.24* | -.33* | -.24* | -.20* | .90* | .67 | 1 | |
| Impulsivity | 3 | .30* | .43* | .28* | .28* | .03 | -.20* | -.24* | -.16* | 1 |

1. Total of Suicidal risk 1-1. Negative self-assessment 1-2. Suicidal ideation 1-3. Hopelessness 1-4. Hostility

2. Total of Empathy ability 2-1. Cognitive empathy 2-2. Emotional empathy 3. Total of Impulsivity

3. * $p<.05$

3.2. A Moderating Effect Of Empathy Ability In The Influence Of University Students' Impulsivity Upon A Suicidal Risk

As a result of verifying a moderating effect of empathy ability in the influence of impulsivity upon a suicidal risk, it is as Table 2.

Table 2. A moderating effect of empathy ability in the influence of impulsivity upon a suicidal risk

| | Step1 | Step2 | Step3 |
|-------------------------|-------|--------|--------|
| Independent variable(X) | .295* | .269* | .262* |
| Moderating variable(M) | | -.277* | -.244* |
| X× M | | | -.141* |
| R ² | .087 | .163 | .182 |
| Δ R ² | | .076* | .019* |

* $p<.05$

At step 1 on the influence of impulsivity upon a suicidal risk, the higher impulsivity($\beta=.295, p<.05$) led to the higher suicidal risk. The explanation power appeared to be 8.7%. At step 2 that injected a moderating variable(empathy ability), the explanation power with 7.6% was indicated to rise significantly($p<.05$). In other words, it implies that the higher empathy ability($\beta=-.277$) leads to the lower suicidal risk. At stage 3, a moderating

effect of empathy ability was examined. The increment of determination coefficient with 1.9% rose significantly($p<.05$). Accordingly, the empathy ability was shown to regulate the influence of impulsivity upon a suicide risk. Examining the form and the effect of empathy ability that Sharma, Durand & Gur-Arie(1981) presented, in consequence of inspecting the form of a moderating effect, even the moderating variable in the interaction term appeared to be significant. Thus, the empathy ability can be known to play a role of a quasi moderating variable. As a result of checking an effect, the case that a mark in independent variable and moderating variable includes +, - can be known that the bigger moderating value leads to the weskerpositive(+) impact of independent variable on dependent variable. That is to say, it implies that the higher empathy ability leads to the lower influence of impulsivity and suicidal risk. The whole value of suicide risk was seen to have a significant influence. Thus, a moderating effect was verified on a value by sub-factor of suicide risk. The results are as Table 2.

Table 3. A moderating effect of empathy ability in the influence of impulsivity upon sub-factor of suicidal risk

| Variable | step 1 | step 2 | step 3 | |
|--------------------------|-------------------------|--------|--------|--------|
| Negative self-assessment | Independent variable(X) | .425* | .407* | .400* |
| | Moderating variable(M) | | -.204* | -.173* |
| | X × M | | | -.128* |
| | R ² | .181 | .222 | .238 |
| | ΔR ² | | .041* | .015* |
| Suicidal ideation | Independent variable(X) | .278* | .250* | .242* |
| | Moderating variable(M) | | -.304* | -.269* |
| | X × M | | | -.147* |
| | R ² | .077 | .169 | .189 |
| | ΔR ² | | .092* | .020* |
| Hopelessness | Independent variable(X) | .283* | .263* | .254* |
| | Moderating variable(M) | | -.215* | -.175* |
| | X × M | | | -.171* |
| | R ² | .080 | .126 | .153 |
| | ΔR ² | | .046* | .027* |
| Hostility | Independent variable(X) | .031 | .013 | .012 |
| | Moderating variable(M) | | -.192* | -.187* |
| | X × M | | | -.022 |
| | R ² | .001 | .038 | .038 |
| | ΔR ² | | .037* | .000 |

* $p<.05$

First of all, in consequence of verifying a moderating effect of empathy ability in the influence of undergraduates' impulsivity upon negative self-assessment, it is as Table 3. At step 1 on the influence of impulsivity upon negative self-assessment, the higher impulsivity($\beta=.425$, $p<.05$) led to the higher negative self-assessment. The explanation power was indicated to be 18.1%. At step 2 that inputted a moderating variable(empathy ability), the explanation power with 4.1% was shown to grow significantly($p<.05$). In other words, it implies that the higher empathy ability($\beta=-.204$) leads to the lower negative self-assessment. At step 3, a

moderating effect of empathy ability was inspected. The increment of determination coefficient with 1.5% mounted significantly($p<.05$). Hence, the empathy ability appeared to regulate the influence of impulsivity upon negative self-assessment. Also, as a result of inquiring into the form of empathy ability(moderating variable), it can be known to act as a similar moderating variable. In the outcome of examining the effect, it can be known that the higher empathy ability as a moderating variable leads to the lower positive(+) influence of impulsivity upon negative self-assessment. This result implies that the higher empathy ability leads to the lower influence of impulsivity and negative self-assessment.

Sequentially, the outcome that verified a moderating effect of empathy ability in the influence of university students' impulsivity upon suicidal ideation is as Table 3. At step 1, the higher impulsivity($\beta=.278$, $p<.05$) led to the higher suicidal ideation. The explanation power was shown to be 7.7%. At step 2, the explanation power with 9.2% was indicated to increase significantly($p<.05$). In other words, it implies that the higher empathy ability($\beta=-.304$) leads to the lower suicidal ideation. At step 3, the increment of determination coefficient with 2.0% rose significantly($p<.05$). Accordingly, the empathy ability appeared to regulate the influence of impulsivity upon suicidal ideation. In addition, as a result of examining the form of empathy ability(moderating variable), it can be known to play a role of a similar moderating variable. In the outcome of having inspected the effect, it can be seen that the higher empathy ability as a moderating variable leads to the lower positive(+) influence of impulsivity upon suicidal ideation. This result implies that the higher empathy ability leads possibly to the lower influence of impulsivity and suicidal ideation.

Finally, the outcome that verified a moderating effect of empathy ability in the influence of undergraduates' impulsivity upon hopelessness is as Table 3. At step 1, the higher impulsivity($\beta=.283$, $p<.05$) led to the higher hopelessness. The explanation power was shown to be 8.0%. At step 2, the explanation power with 4.6% was indicated to grow significantly($p<.05$). That is to say, it implies that the higher empathy ability($\beta=-.215$) leads to the lower hopelessness. At step 3, the increment of determination coefficient with 2.7% mounted significantly($p<.05$). Hence, the empathy ability appeared to regulate the influence of impulsivity upon hopelessness. Also, as a result of inquiring into the form of empathy ability(moderating variable) through Fig. 5, it can be known to act as a similar moderating variable. In the outcome of examining the effect, it can be seen that the higher empathy ability as a moderating variable leads to the lower positive(+) influence of impulsivity upon hopelessness. This result implies that the higher empathy ability leads probably to the lower influence of impulsivity and hopelessness.

But, in the case of hostility, impulsivity does not appear to have a significant effect on hostility in the step 1, which verifying the influence of independent variable upon dependent variable($\beta=.031$, $p>.05$).

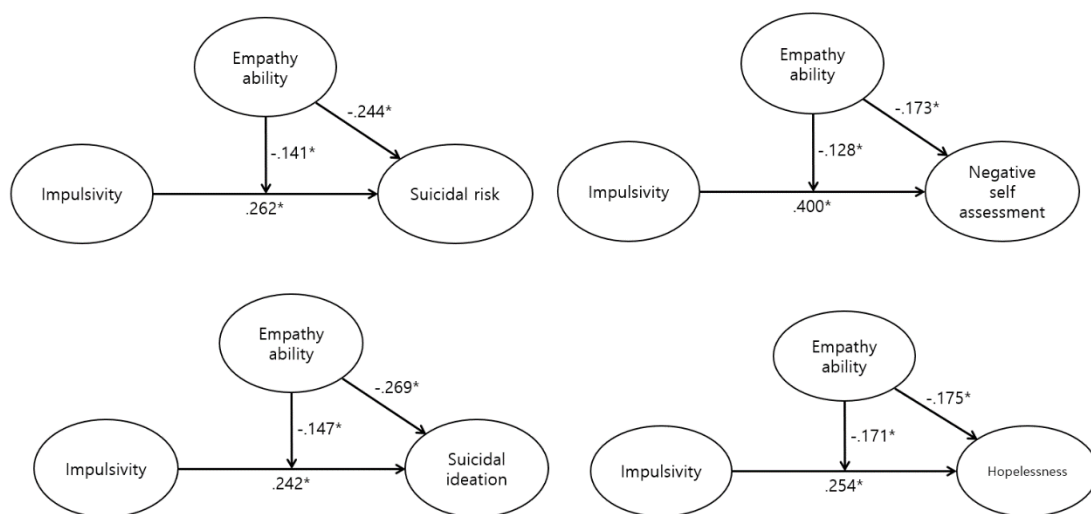


Fig1.Results of the moderating effect of empathy ability

4. Discussion

The discussions according to the results of this study are as follows. A moderating effect of empathy ability was searched in the influence of university students' impulsivity upon a suicidal risk[22]. In consequence of inspecting the influence of impulsivity upon a suicidal risk at step 1, the outcome was drawn that the higher impulsivity in undergraduates may lead to the higher suicide risk. The result of this study is being supported by

the research report by Wo and Kim[23] who reported that people thinking of suicide have the emotional and affective impulse rather than the accurate recognition on reality. Impulsivity is not only a factor of increasing a suicidal risk but also the major factor of allowing more fatal suicide attempt to be made. In this context, the methodical approach that reduces impulsivity of being possessed by an individual can be found through this study. At step 2, the influence of university students' empathy ability upon a suicidal risk was checked. As a result, it was shown that the higher empathy ability leads to the lower suicidal risk.

This outcome keeps in with Kang's[24] research as saying of being able to show the tendency of trying to overcome along with psychological difficulty that oneself faced now through positive interaction with other people, rather than the negative thought like suicidal ideation in case of the high empathy ability when being exposed to a stress situation. The most important empathy ability in forming positive interpersonal relationship can not only reduce a suicidal risk but also play a role of preventing a person who already attempted suicide from thinking of suicidal ideation any more. In this aspect, the enhancement in an individual's empathy ability can be known to be very important. At step 3, a moderating effect of empathy ability was checked in the influence of university students' impulsivity upon a suicidal risk. As a result, it could be known that the influence of impulsivity upon a suicide risk can be dropped when the level of empathy ability as a moderating variable gets higher.

The research by Nordgren et al.[25], which reported that the individual impulsivity can be diminished given being provided environment available for full empathy in interpersonal relationship, is alluding to the necessity of raising an individual's empathy ability level as a plan for regulating impulsivity. In the preventive approach for bringing down impulsivity and suicidal risk, it is very crucial to improve university students' empathy ability level. Hence, before exploring the influence upon a suicidal risk, the program and educational approach need to be made so that undergraduates can enhance empathy ability in interpersonal relationship.

Second, in the influence of university students' impulsivity upon sub-factors(negative self-assessment, suicidal ideation, hopelessness, hostility) of suicide risk, a moderating effect of empathy ability was examined. As a result of the analysis, the impulsivity factor at step 1 appeared to have a significant impact on negative self-assessment, suicidal ideation, hopelessness factor excluding hostility factor. This study keeps in with the previous research as saying that own negative assessment and hopelessness can be shown due to the guilty conscience of having failed to control own impulsive action oneself, and with the research result by Oh andKweon[26] as saying of being able to get higher even in suicidal ideation when impulsivity is high. Step 2 was checked the influence of university students' empathy ability upon negative self-assessment, suicidal ideation and hopelessness factor. Consequently, the empathy ability was shown to have significant influence upon negative self-assessment, suicidal ideation and hopelessness. The outcome of this study is being supported by the findings by Tierney andMcCabe[27] as saying that the positive interaction accompanied by empathy ability can lower hopelessness and suicidal ideation[28], and that the high-level empathy ability can reduce social anxiety and negative self-assessment.

Even at step 3 of looking into a moderating effect, the empathy ability appeared to regulate a causality among impulsivity, negative self-assessment, suicidal ideation and hopelessness. In other words, it is mentioned that the influence of a causality among impulsivity, negative self-assessment, suicidal ideation and hopelessness depending on empathy ability can be varied. As for this outcome, this study is advocated by the previous research as saying that the empathy ability can function as a factor available for increasing impulsivity, negative self-assessment, suicidal ideation and hopelessness[29].

However, at step 1 of inspecting a causality between independent variable and dependent variable, the university students' impulsivity was indicated to have no significant influence upon their hostility. Impulsivity is shown a behavior characteristic of being done to oneself or other person, that is, mainly the aggressive action. But a case of hostility shows a characteristic of being represented cognitive distortion and negative emotion to other person[30]. In other words, impulsivity has a motive of trying to hurt own opponent. In this regard, it may have a common point with hostility. However, hostility has a close relationship with the cognitive-affective aspect. On the other hand, a slight difference can be shown in that hostility has a close relationship with the cognitive-affective aspect, but that impulsivity may have a close relationship with the behavioral aspect[31]. The previous research as saying that there may be high possibility of causing behavioral problems such as temper tantrum, aggressive/violent behavior, extroversion including hyperactivity rather than cognitive-affective difficulty because of having difficulty in controlling own behavior when impulsivity is continued is hinting at which the impulsivity as a causal variable of hostility may have no significant impact[32]. Also, the finding by Ahn and Song[33] as saying that impulsivity may act as the major factor of predicting delinquent behaviors like drinking, smoking alcohol and violence is verifying that impulsivity may not function as a factor variable of predicting the hostility factor, which has a high relationship with cognitive and affective problem.

5. Conclusion

The significances of this study are as follows. First, the existing researches have been mainly progressed targeting people or adolescents who now have a problem of emotional behavior, in order to arrange a plan for lowering a suicide risk. However, this study has a meaning with regard to having targeted university students who show the trend of continuously rising among subjects with a suicide attempt by age. Second, to grasp a cause of suicide risk, the existing research sought a method to reduce a suicide risk through exploring an individual's internal relevant factor focusing on an emotional problem like depression, anxiety and atrophy, and a problem related to cognitive distortion[34][35]. However, this study inquired into impulsivity as a causal variable, which is one of the behavioral problems, which are shown in common in people who are linked to a suicide attempt. Furthermore, to find a plan for decreasing university students' impulsivity and suicide risk, the empathy ability of corresponding to a relational factor was applied. This study led to being capable of finding that the positive interaction with the surrounding environment can be very effective for preventing a suicide risk. Third, this study checked which causality that the sub-factors of suicide risk have with impulsivity, and whether there is a difference in influence among variables depending on empathy ability level. As a result, all factors excluding hostility factor was found to have a significant causality with impulsivity. Basic data could be secured by inspecting that the empathy ability can act as weakening the influence of causality among sub-factors of impulsivity and suicide risk. Finally, this study led to being capable of discovering that the undergraduates' impulsivity factor did not function as a factor of increasing hostility, but that the empathy ability can act as a factor of lowering university students' impulsivity. Accordingly, the necessity of likely enhancing their empathy ability level as a way of dropping university students' suicide risk could be found through this study.

The following include the limitations in this study and the suggestions for a further research. First, this study conducted a questionnaire survey targeting students who are attending universities where are located in Daegu and Gyeongbuk. Accordingly, a follow-up research needs to raise generalization of the findings through carrying out a questionnaire survey targeting students who are attending universities in various districts. Second, this study implemented the analysis regardless of gender even if there may a difference by gender in impulsivity, empathy ability and suicide risk factor that were used in this study. In addition, much more significant data will be able to be secured if a later research examines a causality according to gender. Third, this study looked at the influence upon a suicide risk in impulsivity factor of corresponding to behavioral aspect in university students. However, the depression & anxiety factor, which is relevant to the emotional aspect, can also act as a factor of predicting a suicide risk. Thus, a follow-up research needs to verify even the emotional aspect that an individual has. Fourth, this study inspected a moderating effect focusing on the whole value with seeing empathy ability as a primary factor. But there may be a difference in the influence upon a suicide risk according to emotional and cognitive empathy ability. Hence, a further research is proposed to examine the influence related to a suicide risk through elaborating this a little more.

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