

Predictors of Suicide Attempts in Out of School Youths

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학교 밖 청소년의 자살시도 영향요인

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Abstract This study is a secondary data analysis study using the 1st Panel Survey of School Dropouts in Korea for investigating predictors of suicide attempts in out-of-school youths (OSYs). Data analysis were performed using the SPSS 26.0 statistical program. Suicide attempts were reported in 62 (8%) of the 776 participants included in the study. Logistic regression analysis revealed that suicide attempts before school dropout (OR=10.66), experience of violence victimization (OR=6.97), alcohol consumption (OR=3.73), depression (OR=2.62), parental attachment (OR=0.47), peer relationships (OR=0.63) before school dropout were significant predictors of suicide attempts. Prevention of suicide attempts by OSYs should be preceded by confirmation of their experience in suicide attempts before school dropout. In addition, it is required to establish a suicide prevention program considering psychological situations, interpersonal relationships, and violence experiences.

Key Words : Convergence, Student Dropouts, Suicide Attempted, Parent-Child Relations, Problem Behavior

요약 본 연구는 학교 밖 청소년의 자살 시도 예측 변수를 조사하기 위해 학업중단청소년 패널조사 1차년도 조사자료를 사용한 2차 데이터 분석 연구이다. 자료 분석은 SPSS 26.0 통계 프로그램을 사용하여 수행되었다. 연구에 포함된 776명의 참가자 중 62명(8%)에서 학업중단 이후 자살 시도가 보고되었다. 로지스틱 회귀분석 결과, 학업중단 이전의 자살 시도 경험(OR=10.66), 폭력피해 경험(OR=6.97), 음주(OR=3.73), 우울(OR=2.62), 부모애착(OR=0.47), 또래와의 관계(OR=0.63)가 학업 중단 이후 자살 시도의 유의한 예측인자였다. 따라서 학교 밖 청소년의 자살 시도를 예방하기 위해서는 학업 중단 전의 자살 시도 경험을 확인해야 한다. 또한 심리적 상황, 대인관계, 폭력경험 등을 고려한 융합적 자살예방 프로그램의 수립이 필요하다.

주제어 : 융합, 학교 밖 청소년, 자살시도, 부모-자녀 관계, 문제행동

1. Introduction

1.1 Necessity of the study

Suicidal behavior is one of the major health problems of adolescents. In 2016, the adolescent suicide rate in Korea was 8.2 per 100,000

population, 1.4 times higher than the OECD average of 5.9, and deaths from suicide continue to increase. Adolescents who have experienced self-harm or suicide attempts, a potential suicide risk group, doubled from 13.5 on average per day in 2014 to 26.9 in 2018 [1]. Suicide

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attempt is a behavior that can harm oneself with the intention of dying, and is a representative suicide-related behavior that occurs in the continuous process of suicidal behavior in which thoughts of suicide lead to suicide [2]. It is not clear as to suicide accidents lead to actual suicidal acts, but suicide attempts lead to suicide and the increase of death related to suicide [3,4]. Considering that the incidence of death may be even higher in the case of previous suicide attempts [5], thus suicide attempts can be seen as a major cause of youth suicide problems. In 2013, the suicide attempt rate of Korean school adolescents was 4.1%, and it slightly decreased to 3.0% in 2019, however, the suicide attempt rate of adolescents outside of school was more than 18% [6].

Experience of violence or the victim of it, previous suicide attempts, and the use of substances such as alcohol could be risk factors of suicide attempts and positive relationships and emotional well-being with school, social connection or family support are protective factors for adolescents [7]. Kim et al. [8] reported that the risk factors for suicide in adolescents include interpersonal stress, depression, impulsivity, low self-esteem, relationship or conflict with parents, economic difficulties, and interpersonal relationships. In addition, it was confirmed that peer relationships, school adjustment, experiences of violence, exposure to media, and suicides of acquaintances affect the suicide of adolescents. Prevention is the most important for adolescents not to commit suicide. The domestic approach to suicide prevention and coping method is mainly focused on preventive education programs or counseling programs in schools, and these programs are made in connection with the local communities [8]. While school youths within the institutional category are

being managed by various suicide prevention programs, the out-of-school youths are out of the school system. However, there are no previous studies that identified and reported the basic conditions or comprehensive data related to suicide attempts targeting out-of-school adolescents in Korea.

Every year, many students quit studying for a variety of reasons, including individual, family, school and peer, and community factors [9]. The dropout rate of Korean adolescents ranged from 0.9% to 1%, with a total of 52,261 students dropping out of school in 2019 [10]. Moreover, school problems are included as one of the important factors influencing suicide of adolescents and they include bullying, violence, sexual or discipline about problematic behavior in school, as well as quitting from school [11]. Discontinuation of study makes the adolescents put under an uncontrolled environment outside of school, so they are easily exposed to crisis and they are more likely to experience problem behaviors such as drinking, smoking, assault, extortion, substance abuse, and other problematic behaviors such as suicide attempts [12,13]. Out-of-school youths struggle negative stigma from the society for the reason of withdrawal from regular schoolwork [14], which could influence them to be highly isolated and depressed, leading to suicidal thoughts and suicide attempts [15]. Therefore, it can be seen that the suicide of out-of-school youths are in a more dangerous situation than that of school youths.

Adolescents are vulnerable to mental health, and the majority of the studies conducted in terms of factors related to suicidal thoughts are conducted from general adolescents. Moreover, research findings about suicidal attempts from the local and international studies are limited. As noted, in Korea, the number of teenagers

who quit studying is increasing year by year, the Panel Survey of School Dropouts (PSSD) was conducted five times from 2013 to 2018 to understand their lives and consciousness. This study aimed to investigate the predictive factors of suicide attempts by using the data from the first year survey, which is a close-up data after school interruption, in order to identify the risk factors of suicide attempts after school interruption and to prevent actual suicide in high-risk adolescents at high risk of suicide. The findings could provide the basis for the establishment of major policies on the promotion of mental health.

1.2 Purposes

This study was conducted to understand the relationship between the general characteristics of adolescents outside of school, psychological situation, parental relationship, peer relationship, violence victimization, and suicide attempt. Specially, this study tends to

- Understand the general characteristics of the study subjects, psychological/emotional situation, parental relationship, peer relationship, experiences in problem behavior, and attempted suicide after withdrawal school.
- Identify differences in suicide attempts after school interruption based on general characteristics, psychological and emotional situations, parental relationships, peer relationships, and experiences in problem behavior.
- Identify the influencing factors associated with suicidal attempts after school dropout.

2. Method

2.1 Research Design

This study is a correlation study with a secondary analysis of raw data of the 1st PSSD.

2.2 Participants and Data Collection

This study was carried out after obtaining approval (No. 202010-SB-140-01) from the IRB of the affiliated university and approval for use of the original data from the Korea Youth Policy Institute.

A total of 776 general out-of-school adolescents who responded to the 1st PSSD were included in this study and adolescents under probation were excluded. The reason why 1st PSSD was used in this study is because it was considered appropriate data to reflect the situation of out-of-school youths immediately after drop out of school. The survey was conducted twice, from June to August and from October to November 2013. The survey method was conducted simultaneously with a one-on-one face-to-face interview survey and a self-entry survey by using a structured questionnaire. The subjects were targeted at teenagers who had stopped studying at middle schools, general high schools, and specialized vocational high schools. The panel was constructed from a list submitted by schools and others.

2.3 Measures

2.3.1 General characteristics of participants

General characteristics included gender, age, school dropout periods, family economic level, parents' marital status, smoking experience, and drinking experience.

2.3.2 Psychological situation

1) Self-esteem

Self-esteem was surveyed as 5 items to measure positive self-esteem among Rogenberg's self-esteem scale [16]. This tool consisted of a 4-point Likert scale and higher scores mean higher self-esteem (range 5-20). In this study, the reliability Cronbach's α was .84.

2) Depression

Depression was investigated as a scale consisting of 10 questions by revising the depression scale by Grasmick and Tittle [17] of the simplified psychological diagnostic test. This tool was composed of a 4-point Likert scale, and the higher the score, the higher the depression. In this study, the reliability Cronbach's α was .88.

3) Impulsiveness

Impulsiveness was investigated on a 5-item scale translated by Lee [18] on the self-control scale developed by Grasmick and Tittle [17]. This tool is composed of a 4-point Likert scale, and the higher the score, the higher the impulse. In this study, the reliability Cronbach's α was .71.

2.3.3 Parental relationship

1) Parental attachment

Parental attachment was investigated as a scale that revised the 14-item parental attachment tool developed by Choi et al. [19] to 8 items. This tool was composed of a 4-point Likert scale, and the higher the score, the higher the parental attachment. In this study, the reliability Cronbach's α was .91.

2) Parental neglect

Parental neglect was measured by 5 items of parental neglect among the scales of parental parenting behavior perceived by Huh [20]. This tool was composed of a 4-point Likert scale, and the higher the score, the higher the neglect of parents. In this study, the reliability Cronbach's α was .78.

3) Parental abuse

Parental abuse was measured by revising 4 questions on physical and emotional abuse used in the third year of the first-year middle school panel survey of Korean children and adolescents [21]. Each question was composed of a 4-point Likert scale, and the higher the score, the more parental abuse was experienced. In this study, the reliability Cronbach's α was .88.

2.3.4 Peer relationship

Peer relationship was measured by the 3 questions used in the study of support plans for the promotion of mental health of children and adolescents [19]. Each question was composed of a 4-point Likert scale, and the higher the score, the better the friend relationship. In this study, the reliability Cronbach's α was .88.

2.3.5 Experiences in problem behavior

Problem behaviors included experiences of bullying, violence, or suicide attempts before dropping out of school, and were categorized by whether or not they experienced each problem behavior. Problem behavior experience was classified according to the presence or absence of each problem behavior experience before school drop out.

2.3.6 Suicide attempts

Suicide attempts were categorized by the presence or absence of suicide attempts after drop out of school.

2.4 Data analysis

Data were analyzed using the SPSS/WIN 26.0 program. Descriptive statistics were used for general characteristics of adolescents outside of school, psychological and emotional situations, parental relationships, peer relationships, violence victimization experience, and suicide attempts. The t-test, χ^2 test, and Fisher's exact test were performed to confirm the difference in suicide attempts, according to general characteristics, psychological situations, parental relationship, peer relationship, and experiences in problem behavior. Logistic regression analysis was performed to identify the factors influencing suicide attempts, odds ratio, and 95% confidence interval were calculated.

Table 1. General Characteristics of Participants (N=776)

Characteristics	Categories	n(%) or M±SD
Gender	Male	444 (57.2)
	Female	332 (42.8)
Age (year)	13~15	16.83±1.09
	16~18	76 (9.8)
	≥19	685 (88.3)
		15 (1.9)
School dropout periods	<6 months	274 (35.3)
	6~12 months	299 (38.5)
	>12 months	203 (26.2)
Economic status	Low	279 (36.0)
	Middle	307 (39.5)
	High	190 (24.5)
Parents' marital status	Married	427 (55.0)
	Other	349 (45.0)
Smoking	No	333 (42.9)
	Yes	443 (57.1)
Alcohol drinking	No	310 (39.9)
	Yes	466 (60.1)

3. Result

3.1 General characteristics of participants

Table 1 shows the general characteristics of adolescents outside the school for this study.

57.2% of the subjects were male, and the average age was 16.8 years old (SD=1.09). The period after dropping out of school was 38.5% between 6 and 12 months, 35.3% under 6 months, and 26.2% over 12 months. The economic level was 'medium' at 39.5%. As for the marital status of the parents, 55.0% were married, and 45.0% were divorced or separated. The current smoking experience was 57.1%, and the current drinking experience was 60.1%.

3.2 Differences in experience of suicide attempts after school dropout according to general characteristics

Suicide attempts differed in general characteristics in gender, economic level, parental education level, smoking, and alcohol consumption (Table 2). 62.9% of women attempted suicide after discontinuing school, that number was more than that of men ($\chi^2=11.14$, $p=.001$). In the suicide attempted group, the economic level of 'low' was 53.2%, more than 34.4% of the group who did not commit suicide

Table 2. Differences in Suicide Attempts after School Dropout according to General Characteristics

Characteristics	Categories	No experience in suicidal attempt (n=714)	Experience in suicidal attempt (n=62)	χ^2 or t	p
		n (%) or M±SD	n (%) or M±SD		
Gender	Male	421 (59.0)	23 (37.1)	11.14	.001
	Female	293 (41.0)	39 (62.9)		
Age (year)		16.83±1.09	16.84±1.07	-0.07	.947
School dropout periods	<6 months	252 (35.3)	22 (35.5)	0.38	.829
	6~12 months	277 (38.8)	22 (35.5)		
	>12 months	185 (25.9)	18 (29.0)		
Economic status	Low	246 (34.4)	33 (53.2)	9.15	.010
	Middle	291 (40.8)	16 (25.8)		
	High	177 (24.8)	13 (21.0)		
Parents' marital status	Married	399 (55.9)	28 (45.2)	2.65	.104
	Other	315 (44.1)	34 (54.8)		
Smoking	No	316 (44.3)	17 (27.4)	6.60	.001
	Yes	398 (55.7)	45 (72.6)		
Alcohol drinking	No	298 (41.7)	12 (19.4)	11.91	.001
	Yes	416 (58.3)	50 (80.6)		

($\chi^2=9.15$, $p=.010$). Smoking ($t=6.60$, $p=.010$) and alcoholic beverages ($t=11.91$, $p=.001$) in the suicide attempt group were also more frequent. There was a significant difference between father's and the mother's education level ($\chi^2=6.73$, $p=.035$; $\chi^2=6.55$, $p=.038$, respectively). In the suicide attempt group, 62.9% of the father's and 67.8% of the mother's education levels did not graduate from high school.

3.3 Differences in suicide attempts according to psychological situations parent and peer relationships, and violence victimization.

In the psychological situation of the participants, the suicide attempt group showed low self-esteem ($t=6.16$, $p<.001$) and the

depression ($t=-8.88$, $p<.001$) and impulsivity ($t=-4.42$, $p<.001$) were high among the subjects. Also, in the suicide attempt group, peer relationship is significantly lower ($t=3.33$, $p<.001$) and parental attachment is low in parental relationships ($t=4.22$, $p<.001$). And, the parental neglect ($t=-3.62$, $p<.001$) and parental abuse ($t=4.45$, $p<.001$) were significantly higher. The experiences of violence victimization ($t=16.46$, $p=.003$) and suicide attempts before school dropout ($t=154.45$, $p<.001$) were also significantly higher (Table 3).

3.4 Factors influencing suicide attempts

The results of logistic regression analysis, including variables that showed significant

Table 3. Differences in Suicide Attempts after School Dropout according to Study Variables

Variables	Range	Total	No experience in suicidal attempt (n=714)	Experience in suicidal attempt (n=62)	x ² or t	p
			n (%) or M±SD	n (%) or M±SD		
Psychological situations						
Self-esteem	1–4	2.97±0.55	3.01±0.52	2.52±0.61	6.16	<.001
Depression	1–4	2.06±0.59	2.01±0.56	2.67±0.56	−8.88	<.001
Impulsivity	1–4	1.98±0.58	1.95±0.57	2.28±0.60	−4.42	<.001
Peer relationships	1–4	3.06±0.72	3.09±0.70	2.71±0.89	3.33	.001
Parental relationships						
Parental attachment	1–4	2.96±0.65	3.00±0.61	2.52±0.86	4.22	<.001
Parental neglect	1–4	1.87±0.60	1.85±0.59	2.13±0.60	−3.62	<.001
Parental abuse	1–4	1.82±0.79	1.78±0.77	2.24±0.84	4.45	<.001
Experiences in problem behavior						
Bullying						
No		770 (99.2)	710 (99.4)	60 (96.8)	5.28 [†]	.076
Yes		6 (0.8)	4 (0.6)	2 (3.2)		
Violence victimization						
No		767 (98.8)	709 (99.3)	58 (93.5)	16.46 [†]	.003
Yes		9 (1.2)	5 (0.7)	4 (6.5)		
Suicide attempts before school dropout						
No		643 (82.9)	627 (87.8)	16 (25.8)	154.45	<.001
Yes		133 (17.1)	87 (12.2)	46 (74.2)		

[†] Fisher's exact test

differences in the general characteristics, psychological situations, peer relationship, parental relationship, violence victimization, and suicide attempts before school dropout to find the factors influencing the participants' suicide attempts are as follows.

In the Hosmer-Lemeshow test, the model was ($\chi^2=6.33$, $p=.610$). Predictive factors affecting suicide attempts are the experience of attempting suicide prior to school dropout (OR=10.66, 95% CI: 5.33, 21.32), experience of violence victimization (OR=6.97, 95% CI: 1.25, 38.80), alcohol drinking (OR=3.73, 95% CI: 1.39, 10.05), depression (OR=2.62, 95% CI: 1.27, 5.41), parental attachment (OR=0.47, 95% CI: 0.25, 0.88), peer relationship (OR=0.63, 95% CI: 0.42, 0.96) in order (Table 4).

4. Discussion

This study attempted to identify the predictors of suicide attempts of out-of-school adolescents and to present the basis for mediation and policy development. As a result of analyzing, using the data from the first year of the PSSD, which is a national survey, suicide attempts occurred in 8% of all out-of-school adolescents. They had poor relationships with their peers and parents, and had more experiences of victims of violence and suicidal attempts before discontinuing school.

The suicide attempt rate of school adolescents in Korea was 4.1% in 2013 and slightly decreased to 3.0% in 2019 [6]. Among the subjects included in this study, the suicide attempt before dropping out was 62 out of 776 out of school adolescents (17.1%), and among 62 adolescents who had attempted suicide, the rate of repeated suicide attempts even after dropping out was 46 (74.2%). A direct comparison could

Table 4. Factors Influencing Suicide Attempts after School Dropout

Variables	Categories	Odds ratio (95% Confidential interval)	<i>p</i>
Gender (Ref.=Male)	Female	1.44 (0.72~2.88)	.304
Economic status (Ref.=High)	Low Middle	0.54 (0.22~1.35) 0.49 (0.19~1.24)	.188 .132
Smoking (Ref.=No)	Yes	0.63 (0.25~1.57)	.318
Alcohol drinking (Ref.=No)	Yes	3.73 (1.39~10.05)	.009
Psychological situations			
Self-esteem		0.58 (0.30~1.09)	.090
Depression		2.62 (1.27~5.41)	.009
Impulsivity		0.92 (0.48~1.78)	.811
Peer relationships		0.63 (0.42~0.96)	.030
Parental relationships			
Parental attachment		0.47 (0.25~0.88)	.018
Parental neglect		0.87 (0.45~1.68)	.679
Parental abuse		0.98 (0.62~1.53)	.921
Experience in problem behavior			
Violence victimization (Ref.=No)	Yes	6.97 (1.25~38.80)	.027
Suicide attempts before school dropout (Ref.=No)	Yes	10.66 (5.33~21.32)	<.001

not be made because it was difficult to find any previous studies that reported the suicide attempt rate among out-of-school adolescents. However, the repeated suicide attempt rate confirmed in this study is higher than the repeated suicide rate of 13.1% to 16.6% among European and North American adolescents [11,22]. In the findings of this study, since the incidence of repeated suicide attempts increases by more than 10 times when they have experienced suicide attempts, their experience of suicide attempts will be a part to be noted above all. In this study, it was found that suicide attempts after discontinuation of school were most affected by previous suicide attempts.

Hawton et al. findings report that previous experiences of self-harm or suicide attempts are strongly associated with suicide [4]. The risk of suicide increases by 3 to 30 times when suicide attempts are made, although it varies by gender and 1-6% among them will die of suicide within one year [11], so adolescents who have attempted suicide will need more active intervention.

The violent victim experience was also a significant factor in suicide attempts, which was found to increase suicide attempts by about 7 times. Previous studies reported that when adolescents were exposed to violence, such as school violence, suicidal behavior had a significant effect on suicidal behavior, and when this was done both online and offline, the suicidal behavior was reported to be higher [23]. When adolescents experience violence, depression significantly increases, which leads to suicidal thoughts [24], which can lead to suicide attempts [2]. Therefore, in the case of adolescents with experiences of violence, it is necessary to conduct investigations and interventions on suicide-related behaviors.

In terms of drinking alcohol, suicide attempts

increased by 3.7 times. Drinking has a significant positive correlation with the number of suicide attempts [25]. Alcohol consumption is one of the strong risk factors for suicidal behavior. Acute alcohol use may promote suicidal ideation and increase suicidal risk behaviors. In particular, if the intake-response relationship is consistent, the risk of suicide may increase with an increase in alcohol consumption [26]. Since the rate of drinking in the suicide attempt group is high, and drinking is considered a factor that promotes repetitive suicide attempts, measures to mediate the drinking behavior of youth outside the school should be considered together.

One of the leading predictors of adolescent suicide is known as depression [27]. In this study, impulsiveness was significantly higher in the suicide attempt group, but it was not a predictor of suicide attempt. However, the suicide attempt group was more impulsive and depressed, and since depression significantly increased the incidence of suicide attempts by about 2.6 times, measures to promote psychological and emotional health should be included in order to prevent suicide attempts. In terms of psychotic conditions, depression or anxiety can be presented in internal symptoms, and behavioral disorder or antisocial factors usually can be expressed in external symptoms. In terms of relevance to suicide, depression and anxiety are factors that affect both suicidal thoughts and suicide attempts, whereas alcohol or substance abuse is only related to suicide attempts, confirming new evidence in triggering suicide attempts [28].

In this study, attachment to parents and formation of positive relationships with peers were identified as protective factors that suppress suicide attempts. Positive interpersonal relationships contribute to suppressing suicide

attempts [7]. In general, a system that is meaningful to adolescents can be viewed as a family and school system, of which positive interaction with family can be a protective factor for suicide [29]. Since the developmental characteristics of adolescents place an importance on peer relationships, there are some areas that have been accepted as helping their peers to prevent suicide but parents and school support are relatively more important than their peers [30]. However, in this study, when there was a suicide attempt, the relationship with the parents was significantly poor. When establishing mediation to prevent suicide attempts by adolescents outside of school, it is necessary to check the relationship between parents and children and if necessary medication might be considered to improve their relationship.

The results of this study raise the need for an active intervention in adolescents' suicide attempts to be considered before they quit their school life. Adolescents before school dropout may observe various behaviors that might affect suicide attempts, such as depression, suicide attempts, or difficulties in relationships with peers. Above all, after suicide attempts are made, active measures to prevent repetitive suicide attempts must be required. The results of this study showed similar suicide attempts regardless of the period following school dropout. Therefore, the prevention of suicide attempts by out-of-school youths should be considered regardless of the duration of the school dropout.

Although various domestic youth suicide prevention programs have been developed and applied in local communities and schools, it is important to review further the effectiveness of these programs and find ways to improve them. The suicide prevention management of

out-of-school youth may be relatively limited. In fact, out-of-school adolescents in the community usually experience depression or anxiety due to social stigma and the idea that they have deviated from their normal category after quitting their studies. As they transition into adulthood, they experience various worries and negative emotions such as suicidal thoughts, and are possibly threatened with poor psychological health, as well as social interest or research in this matter is insufficient [14]. The health-related demands from local communities require medical checkups or psychological support, however, they are not well-informed due to lack of information and limited local resources [14]. Considering that the responsibility for health cannot be regarded as an individual act ignoring the social structural impact [31], it is necessary to manage through individual case management when adolescents with experience of suicide attempt to discontinue their studies.

Since suicide attempts in this study were measured by the presence or absence of self-reported experiences, the number of suicide attempts, hospital treatment after suicide attempts, or the presence or absence of fatal injury were not considered. In the future, it is recommended to do similar studies using structured suicide attempt tools. Moreover, there is a limitation in the sense that, it is difficult to establish a causal relationship because the cross-sectional data of the first year were only used. Thus, it is meaningful to provide basic data for the development of policies or interventions for the prevention of suicide by using national representative data only targeting out-of-school youth in blind spots in a situation where the suicide rate of adolescents is still high.

5. Conclusion

This study was attempted to explore the factors affecting suicide attempts of out-of-school youth and it was confirmed that the suicide attempt experience prior to school dropout, the violence victim experience, alcohol consumption, depression, and the relationship with parents or peer were factors that influence the suicide attempts of out-of-school adolescents. In order to prevent suicide in out-of-school youth, it is important to pay attention to previous suicide attempts and a comprehensive approach is required to identify negative experiences prior to discontinuation of study and to improve parental relationships while taking into account current mental health and problem behaviors. However, through a longitudinal study, a close search for suicide attempts and influencing factors after school interruption is required.

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