A Study on Youth Prostitution using Mobile Application: Focusing on Korean Youth

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Abstract

The youth prostitution using mobile chatting applications is a serious issue in South Korea. However, it is difficult to learn and prevent situations due to a lack of understanding of the current phenomenon. Even though there have been a few efforts to prevent crimes by lawmaking, it is difficult to change the current problems without understanding the actual situations. To understanding the crime, knowing how people engage youth prostitution and what they use to gain information about youth prostitution are essential. In this study, we researched to find out the keywords used in searching the applications for youth prostitution. Using these keywords, we found that a total of 4,063 mobile chatting applications is linked to youth prostitution. The study analyzed these applications thoroughly to understand the characteristics of these applications and users. Lastly, we proposed prevention strategies based on our research.

Keywords: Mobile Application, Prostitution, Random-Chatting, Youth Prostitution.

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Introduction

For the youth, smartphones are not just about contacting or acquiring information. Teenagers are highly dependent on social media, games, and friendship as a window to escape reality. As the usage of smartphones increases, adolescents are often indiscriminately exposed to harmful online information. It may be natural for curious teenagers to become more interested in stimulating or sensational information in the flood of information. Often, teenagers fall into dangerous situations such as crime. Recently in South Korea, teenagers' use of mobile applications linked to prostitution has become a severe issue.

According to their preferences or trends, teenagers use various functions of mobile applications.[4] Recently, mobile applications for chatting have spread like a fashion among teenagers. According to the Ministry of Gender Equality and Family's 2016 Prostitution Survey, 74.8% of adolescents who have experienced 'conditional meetings (prostitution)' have met their customers through chat applications and chat sites. The prostitution websites have been gradually evolving into a form that utilizes online such as chat applications for mobile phones. A chat application (also called 'random chatting application') is an application that provides the opportunity for a user to contact an unspecified person without exposing his or her identity. The user may be connected to a nearby user by using a location-based service or randomly matched with another user. Regardless of the original development purpose, it became a very convenient system for those who want to use it for an illegal purpose such as prostitution.

The problem is that the chat application cannot currently be classified as a 'youth harmful application[5].' There are some efforts to prevent the youth's harm using mobile applications. The Korea Communications Standards Review Committee is reviewing illegal and harmful information on a public profile, photo, nickname, chat room title, and others. Also, in the application, warning messages against illegal and harmful information are posted. The police are also cracking down on prostitution through applications' direct searches. Some 'adult sites' or 'adult applications' directly present more obvious illegal or harmful adult contents (i.e., porn). However, it is difficult to control and individual applications that provide other types of services (i.e., chatting, blind dates, part-time jobs).

For all ages with chat applications, teenagers can easily be exposed to prostitution. Juveniles in crisis have a desire to make money quickly, and the chat application provides an environment in which the sex shopper and seller can easily contact each other. More seriously, many teenagers start to meet out of curiosity or to make new friends. Adolescents who use the mobile application will accept information about prostitution indiscriminately, and exploiting this advantage, the shopper and dealers are showing a positive attitude toward generating profits.

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[4] An application is a dedicated program for a purpose that can be easily applied by a user for a specific task. Smartphone users can search for various applications in the 'Play Store' or 'App Store' based on the OS and easily download and use them. In Korea, 'application', 'appl', 'app' is used as exchangeable.

[5] The Broadcasting Communication Deliberation Committee selects the 'Juvenile Information Protection Application for Juveniles' and conducts key monitoring and makes requests to correct illegal information such as deletion and access blocking. The application must be registered in the 'store' after development to be open to the public. At this time, if the service type is classified as a chat service, all age groups are available.

Despite many suggestions that prostitution through the chat application is serious, there is a lack of discussion. In the previous research, there is only a legal review to see whether it is legal to regulate prostitution through the chat application, rather than examining the current situation. Therefore, this study is to examine the status of juvenile prostitution through chat applications. Specifically, first, we attempt to grasp a search keyword which users often use to download a chat application. Second, the current study attempts to understand the structure and actual operation status of a chat application that promotes prostitution. Third, the policy suggestions to prevent juvenile prostitution are explored.

1. LITERATURE REVIEW

1.1. Prostitution by chat application
According to the Prostitution Survey by the Ministry of Gender Equality and Family[6] in 2016, 173 young people aged under 19 who experienced a crisis such as prostitution, runaway were surveyed, and the method of funding during the runaway period was 'conditional meeting/prostitution (48.6%)' the highest rate. Moreover, more than half (61.8%) of the respondents answered that they had an experience of prostitution. 74.8% of the main meeting routes were 'random chat application' and 'chat site.'

Currently, the researchers are aware that prostitution through online and chat applications is dangerous, and it is urgent to take measures against them. However, there are not many national studies that have conducted empirically on chat applications. Park Kwang-seon (2016) analyzed the actual operation data of a random chat application based on the investigation of the sexting case of the Cyber Crime Investigation Department of Seoul Metropolitan Police Agency in 2013 and examined the actual situation of the obscene information distributed in random chat. As a result, sexually explicit contact with children and teens such as sexual encounters and sexting were identified, and more than 60% of the picture files exchanged between users in random chat were pornography. In other words, the sense of protection for children and adolescents does not play a significant role in the selection of teenagers for chatting by the adult individual, and this can lead to child sexual exploitation and prostitution.

Chung Hyun-mi et al. (2016) conducted surveys and in-depth interviews with children/youth prostitutes and employees. According to the study, the easy ways for children and adolescents to get into prostitution were smartphone chatting application (61.4%) and internet chat cafe (23.5%). However, there are practical limits to detect and the prostitution of children and juveniles because of nature in cyberspace.

In other countries, sexual misconduct of teenagers, such as sexting, has also become a serious social problem, as well as the problem of prostitution and pornography spreading to children and adolescents on cyberspace (Ybarra & Mitchell, 2014). Online technologies, such as the Internet, have attracted teenagers to the prostitution industry more efficiently. In comparison with general prostitution, online prostitution's youths are

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[6] Prostitution Survey by the Ministry of Gender Equality and Family conducts surveys on prostitution every three years based on Article 4 of the Act on Prevention of Prostitution and Protection of Victims. A total of four surveys were conducted until the year 2016's after the first survey was conducted in 2007.

younger, and 90% of them are engaged by the third party (such as an agency); therefore, police are having difficulties in detecting (Wells, Mitchell, & Ji, 2012). As a result, the cyber environment, such as Internet chatting, has been activating more juvenile prostitution. The previous studies had a collective voice that the enactment of laws and ordinances that can regulate and punish the cyber prostitution environment, which is changing from prostitution through chat applications.

1.2. Legal review of chat applications

Depending on a scholar, the concept of prostitution is different. However, the definition from the 'Act on the Punishment of Prostitution' is widely used in Korea. According to Article 2, Paragraph 1 of the Act, 'prostitution' refers to actions that receive or promise money or other property interests, engage in sexual intercourse or similar sexual intercourse using a part of the body or tools such as mouth or anus with unspecified others. 'Prostitution agency and other acts' refers to the act of providing money, land, and buildings while recognizing the fact that it is provided for the prostitution, inciting or forcing the prostitution, and providing the place for the prostitution. Besides, Article 4 of the law also prohibits all actions related to advertisement of prostitution, such as introducing and arranging employment by knowing that prostitution, procurement of prostitution, an act of trafficking for prostitution, selling sex, employment or recruitment of other persons for the prostitution.

According to the current law, the regulations that can be applied in chat application used for the mediation or brokering of the prostitution of children and youth are as follows. First, the "Act on the Protection of the Sex of Children and Adolescents (the 'Act')" is a way to penalize sanctions. In Article 15 of the Act, the 'Procurement Act of Arrangement.' prohibits the prosecution of children and youth prostitution and the distribution of information related to prostitution.[7] The problem is challenging to apply to prostitution using chat applications in recent years. The chat application is mainly aimed at 'making friends' or 'chatting' on the surface, and it is difficult to punish the user because the user who is not the chat application operator directly uploads the prostitution information.

Following Article 7 of the "Juvenile Protection Act," the chat application is designated as a 'Youth harmful medium,' and its administrative regulations are applied. If it is difficult to designate it as a harmful medium for juveniles, it may be considered to classify the age rating of the application according to Article 8, 'Classification of Media Classification,' and to consider related measures (Kim, 2016). The deliberation and decision of harmful juvenile materials, according to Article 7 of the Juvenile Protection Act, shall be designated by the Juvenile Protection Committee and each deliberative agency. However, most of the existing mobile chat applications are not designated as harmful media for

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[7] Article 15 (1) of the Act on the Protection of the Sexuality of Children and Adolescents states that "the act of buying sex of children and adolescents, And to be punished by an organ imprisonment of more than seven years. In addition, Article 2 of the same article stipulates that those who arrange for the act of buying a child or a juvenile as a business or who provide information on the information network shall be punished by imprisonment for not more than 7 years or a fine not exceeding 50 million won.

young people and will not be designated in the future. Even if it is specified, it is expected that alternative applications with similar purposes will be developed and operated considering the speed of change of application development, registration, and operation process.

According to Article 8 of the Juvenile Protection Act, the Juvenile Protection Committee and each deliberative body are required to set the grade for the juvenile's age to be used for both 'harmful contents for the youth' and net yet decided contents as harmful. However, in the case of a smartphone application, except for the online game application, the youth protection committee or the related deliberation agency does not classify the age separately but follows the 'self-regulation of the provider by the application open market operator.' Therefore, it is difficult for the media rating system in the current Youth Protection Act to put a realistic regulation on the random chat application (Kim, 2016). It is more challenging to detect crime scenes using a standard investigation method than to crack down on prostitution promotional mobile applications in the investigation agencies. It is possible to trace prospecting brokers and sex traffickers by tracking current I.P. addresses, but it is difficult to arrest them because of illegal use of traps. Also, considering that the chat application typically has only about a week's worth of server history, an immediate arrest is needed, such as by induction and induction. The problem is that there is no legal basis in this regard.

Kim, Han-gyun (2014) argues that feasible regulations and policies should be actively examined to prevent sex offenses in children and adolescents actively.[8] In the United States, the Cyber Crime Response Team (ICAC), which is administered by the Office of Juvenile Justice and Delinquency Prevention, the Federal Ministry of Justice, is responsible for effective investigation of sex offenses and child pornography in cyberspace (Mitchell, Kimberly, et al., 2012). As the Internet use of children and adolescents increases rapidly, cyber-space activities of sex offenders who are aiming at children and adolescents increase as the pornography of children on internet floods. Teams were organized under Providing Resources, Officers, and Technology to Cancellation Act Eradicate Cyber Threats to Our Children Act: PROTECT Our Children Act of 2008. As of 2012, 61 cooperative response teams, consisting of 3,000 federal, state, and local investigative agencies and prosecutors, are establishing a nationwide network. Each response team is responsible for investigating sexual harassment, cyber-criminal investigation, and criminal prosecution (Mitchell, Kimberly, et al., 2012; Kim, 2014).

In addition, the Federal Explosion & Obscenity Section, Department of Justice, and Criminal Division of the Criminal Investigation Department of the Federal Ministry of Justice periodically conducts an 'undercover investigation' to strengthen the crackdown and monitoring for the harmful environment of the youth. Undercover online child

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[8] In the case of the Anglo - American law, there is no legal provision to comprehensively justify the misconduct of the investigative agency in the pitfalls or secret investigations. However, anyone who falls into the trap investigation of the investigation agency is proved to be trapped and a defense of entrapment is recognized. In other words, it must be proved that the investigating agency has actively worked or planned to commit a person who is considered to have committed no crime unless they have been convicted or persuaded by the investigator (Jeong, 2009; Kim, 2014).

exploitation investigation is a kind of proactive investigation technique that seeks potential child sexual offenders by disguising themselves as children or adolescents (Kim, 2014).

2. DATA AND ANALYTIC METHOD

The survey identified trends in search keywords related to chat applications during the preliminary survey period (2016.05 ~ 2016.06) and the survey period (2016.09 ~ 2016.10). First, we conducted a substantive investigation of the applications searched by the keywords selected during the preliminary survey.

During the preliminary survey, we looked at application keywords that are often used in connection with prostitution. First, we searched the 'existing keywords (27)' in the Google Play Store, which was used in the actual survey on prostitution in 2013 and figured out the number of applications that could be downloaded for free. Through this process, we could see how the keywords used in 2013 are currently being used. Second, to identify which keywords are being used concerning prostitution in 2016, it is necessary to search for 'new keywords' such as 'terminology related to prostitution,' 'terms related to nightlife,' and 'terms with prostitution.' Third, the top 50 keywords that were searched for in 2016 were selected in order of the keywords that are frequently searched for applications, and the number of applications was searched by re-searching the 'related keywords' presented when those 50 keywords were searched[9]. Finally, we compiled the number of applications that were searched for 'top 50 keywords searched in 2016' and 'related keywords' and selected '2016 final keywords (27)' to search for as many applications possible.

During this survey period, we searched and downloaded all the applications that are searched by 'existing keywords (27)' and '2016 final keyword (27)'. A total of 54 keywords (27 existing keywords, 27 final 2016 keywords) were searched, and a total of 4,063 applications were found. Table 1 presents the number of applications searched by the search keyword. According to the results of the analysis, 209 applications (apps) by 'blind date' (5.1%), 191 apps by 'opposite sex meeting' (4.7%), 190 apps by 'random chatting' (4.7%), 188 apps by 'random chat' (4.6%) and 182 apps by 'meeting' (4.5%) were found. The keywords that can find the fewest applications were 'Emperor tour, demimonde, point five, fairy, watching movies together, having a drink.' As in the keyword selection process, 27 'existing keywords' that were used in the actual survey of prostitution in 2013 showed a low utilization rate, and the 'final keywords' selected in 2016 were mainly used. On the surface, many keywords seemed to have nothing to do with prostitution.

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[9] Related Keywords: When developers register their applications, they attach search keywords that users can use widely to the part that PR of each application. This refers to the relevance between the search keyword and the application, and relates to the search ranking of the application, which is the part of the developer that constantly updates so that many target users find the application. Therefore, we have comprehensively grasped the keyword suggested by the developer in each application and arranged a list of related search terms.

Table 1. Number of applications retrieved with 54 keywords

	Search Keywords (Number of Apps Searched)
2016 New Keywords	Blind date (200), opposite sex meeting (191), random chatting (190), random chat (188), meeting (182), regional meeting (166), anonymous chat (166), meeting (165), chatting (163), friend of opposite sex (156), opposite sex (155), dating (143), ideal type (112), lover making (111), escape single (129) making friend (124), real blind date (107), adult dating (107), fun talk (103), relation (102), making lover (98), boyfriend/girlfriend (90), healthy sex meeting (89), conversation with strangers (82), conditional meeting (63), home massage service (49), massage (37)
2013 Existing Keywords	Lover meeting (143), a meeting part-time (56), lover agency (53), a video chat (42), drinking friend (42), phone chatting (36), Sexy chatting (35), proxy part-time (34), special meeting (28), special part-time (26), nude chatting (24), Conditional meeting (18), pay meeting (17), fox chat (9), night culture (5), ten pro (3), night fairy (3), enjoy partner (2), entertainment portal (2), sitting mat house (1), Bukchangdong (1), fairy (1) let's drink together (1), let's watch movie together (1), point five (1), demimonde (1), the emperor tour (1)

Fifty-four keywords searched a total of 4,063 applications. Except for duplicate applications, there are a total of 832 applications for the final research. The 832 applications collected were identified as 'how relevant they are to prostitution' and classified into four types as follows.

Table 2. Application Type

Type of Application	Number of Application	Percent (%)
Prostitution Related	317	38.1
Not Prostitution Related	265	31.9
Disappeared	102	12.3
Others	148	17.8
Total	832	100.0

'Prostitution related' type can be used to directly obtain prostitution information by uploading posts related to prostitution and prostitution within the application and obtaining indirect prostitution information through 'bulletin board, chat, one-to-one conversation.' 'Not Prostitution Related' refers to applications that have nothing to do with prostitution. 'Disappeared' means that the search was possible, but the application was

deleted at the time of the investigation and was inaccessible[10]. 'Others' refers to an application that did not run during the investigation period, terminated immediately upon execution, did not have a membership, or did not log in after signing up[11].

Table 3. Survey Contents

Research content: Application characteristics
The number of downloads, the information related to development and operators, the age of use, membership, homepage connected, whether the user is authenticated, whether the user is registered, whether the prostitution prevention and enforcement notice, type, location service, social media account, payment method, providing free credits, ad availability, ad format

Among the four types of classification results, 317 (38.1%) of the prostitution-related applications were the most common, and the number of applications that had become extinct was substantial; thus, the number of prostitution-related applications is expected to be substantially higher than the presented number. Therefore, the final research target of this study is 317 prostitution-related applications.

3. RESULTS

3.1. Chat application download status

Table 4 is the download status of chat applications related to prostitution. The number of downloads is a number that automatically updates the Google Play Store to show how many users have downloaded the application.

As a result of the analysis, it was shown that the apps with the number of downloads were between '1,000 and 10,000 people' were 106 (33.4%) and '10,000 – 100,000', 82 (25.9%). More than half of the applications directly or indirectly provide users with a size of 1,000 to less than 100,000. Despite the presence of many other applications providing similar services, the number of users of applications that directly or indirectly provide prostitution information was significantly higher and more active.

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[10] Some of the applications that were searchable during the survey period were 'not searchable' after the end of the survey period. Note that if the application is gone, the application should not be running. However, even though it is no longer searchable, some of the previously downloaded applications have been running. In other words, even if you crack down on the Google Play Store, users who download and use the prostitution promotion application will still be able to use it.

[11] Additionally, in the course of analyzing and reporting the data after the investigation period (May-September 2016), "blocked" applications were also identified.

Table 4. Application Downloads

Number of Downloads (Person)	Number of Application	Percent (%)
1 – 100	16	5.0
100 – 1,000	60	18.9
1,000 – 10,000	106	33.4
10,000 - 100,000	82	25.9
100,000 – 1,000,000	38	12.0
1,000,000 - 500,000,000	12	3.8
Missing	3	0.9
Total	317	100.0

3.2. Name of chat application developer · Operator status

We looked at 252 chat applications that can identify the developer/operator name among 317 applications to see if there is a duplicate developer/operator name. This process is to understand if a developer/operator is running two or more different applications under a single name.

As a result, most application developers were not duplicated (89.3%), 2 duplicates 20 applications (7.9%), two applications were three duplicates, and ten duplicates (0.8%), ' 9 duplicates' and '12 duplicates' were one application respectively. Therefore, the ratio of applications with duplicate developers (2 to 12) is 10.7%. Notable is that the number of applications developed with a single developer name ranges from two to twelve. It is expected that prostitutes or some profitable operators were exploiting these chat applications.

Table 5. Application developer name duplication status

Developer Name Duplicates	Number of Application	Ratio (%)
No Duplicates	225	89.3
Twice	20	7.9
Three times	2	0.8
5-12 times	5	2.0
Total	252	100.0

3.3. Membership and Authentication Status

A membership indicates whether a user must join the application to download and execute the application. If the user does not need a membership, he/she can enter the information at the same time as he/she runs the application and use the application

immediately. As a result, 238 (75.1%) applications were required to register, and 79 (24.9%) were not.

Also, we examined whether the user is self-authenticated and how to authenticate to run the application. Self-authentication is a process of confirming whether the user is the person him/herself. It is divided into 'device authentication method' and 'real name authentication method.' The 'device authentication method' is a method of confirming whether the device to be registered after receiving the authentication code and inputting in the applications. The 'real name authentication method' refers to the method of completing the authentication of the cellular phone device after inputting the person's date of birth and real name. The survey found that most applications did not require authentication (87.7%). When authentication is required, 16 (5.0%) applications requiring 'blind name authentication' and 23 (7.3%) applications requiring 'device authentication' such as mobile phones.

Of the applications that required membership, 199 (62.8%) did not require authentication, 16 (5.0%) required real-name authentication, 23 (7.3%) required device authentication, and 79 applications (24.9%) do not need both membership and authentication. Most of them need a membership but do not require self-authentication. Next, we looked into different types of applications that did not require both member registration and personal authentication.

Table 6. Cross–table Analysis of Membership and Self-certification Status

Category		Sign–up		Total (%)
		No	Yes	
Personal Authentication	No Authentication	79(24.9)	199(62.8)	278(87.7)
	Real Name Authentication	0(0.0)	16(5.0)	16(5.0)
	Device Authentication	0(0.0)	23(7.3)	23(7.3)
Total		79(24.9)	238(75.1)	317(100.0)

3.4. Age of use

We looked at the age of application usage. The age of use refers to the age limit of the user, as suggested by the application developer. As a result of the analysis, '17 years old' was the highest as 210 (66.2%), '12 years old' 42 (13.2%), '3 years old' 49 (15.5%), and '18 years old' 1 (0.3%), in order. In other words, 317 applications, both directly and indirectly providing information on prostitution, indicate that the youth can easily download and use it. When looking at an application whose age is set to '3' or '7', the use age notice is just a formal process that developers set when registering an application.

Table 7. Age of Use

Age of Use	Number of Application	Ratio (%)
3	49	15.5
7	15	4.7
12	42	13.2
17	210	66.2
18	1	0.3
Total	317	100.0

3.5. Application service type

Table 8 shows the service types provided by the application. The service type indicates what type of information the current application provides. The 'random chat type' is a type that enables a user to connect with other users at random and communicate. 'Binging type' is a type that can communicate with other users in the form of a blind date according to a specific time or condition (a willingness to be informed, an ideal type registered by an individual). 'Video call type' is a type that can make a video call with other users. 'Voice call type' is a type that can communicate with other users without voice or chat. The "bulletin board type" is a form in which a user can create a bulletin board with contents desired by the user and select another user to send a conversation or a message. Lastly, 'Part-time information-providing type' is the same as general job information providing application, but the information is related to prostitution.

As a result of the analysis of 317 applications, 225 (71.0%) of the various types of 'bulletin board type,' 21 (6.6%) of 'random chat type,' and 12 (3.8%) of 'voice call type' appear. A mix of two or more types of services (17.0%) is also noteworthy. It is also possible to obtain prostitution-related information (5.6%) even in applications that provide part-time information. Also, 'bulletin board type' (71.0%), which allows users to select the desired message and make a conversation, showed the highest rate because it is necessary to select information or conditions. These results reflect the demand of users who want to select their own after checking.

3.6. Location-based service and social media account interworking service provision status

Table 9 shows whether 317 applications related to prostitution provide location-based services. Location-based service is a mobile navigation network or a GPS (Global Positioning System)[12] providing various services to the user based on the location information obtained from the user.

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[12] GPS (Global Positioning System) is a satellite navigation system that receives signals from GPS satellites and calculates the user's current position. It is mainly used for navigation devices such as airplanes, ships, and automobiles. Recently, it has been widely used in smartphones and tablet PCs (2016.09.30).

Table 8. Type of Service Provided

Category		Number of Application	Ratio (%)
Simple Type	Random Chat	21	6.6
	Busting	1	0.3
	Video Call	2	0.6
	Voice Call	12	3.8
	Part-time Information Providing	2	0.6
	Bulletin Board	225	71.0
Mix Type	Random Chat+Video Call	1	0.3
	Random Chat+Voice Call	2	0.6
	Random Chat+Bulletin Board	2	0.6
	Video Call+Bulletin Board	22	6.9
	Voice Call+Bulletin Board	6	1.9
	Part-time Information Providing +Bulletin Board	16	5.0
	Random+Video+Bulletin Board	2	0.6
	Random+Voice+Bulletin Board	1	0.3
	Video+Voice+Bulletin Board	2	0.6
Total		317	100.0

Whether to provide location-based services refers to "whether the application itself can determine the user's location and enable certain services with other users nearby." When providing location-based services, the application users are provided with information on how far they are located, so that a user at a nearby location can be selected to send a conversation or a message. On the other hand, in the case of an application that does not provide location-based services, a user can set an 'area' and then use the application. The survey found that 65 out of a total of 317 applications (20.5%) were providing location-based services. These services allow users to share their location information so that direct contact can be made more accessible.

Besides, we found that the application provided the social media account and the 'interlocking service' of the application. As a result, most of the applications did not provide the social media interworking service (92.6%) and in case of providing service, Mixed (3.5%), Facebook (2.5%), KakaoTalk (0.9%) and Google (0.3%), in order.

Table 9. Location–based service availability

Location–based service availability	Number of Application	Ratio (%)
Not available	252	79.5
Available	65	20.5
Total	317	100.0

3.7. Profit structure for promoting prostitution applications

Next, we looked at whether the user should use the payment service to access the application or not. The payment types can be divided into one-time pay per message/chatting ('payment per case'), fixed-rate for a certain period, and both('mix').

As a result, out of the total 317 applications, 177 applications (55.8%) were found to provide payment service. In other words, more than half of the applications were offering payment services, which would allow operators to earn income from payments made by users. According to the results, regarding the payment type for the application that provides the payment service, in 122 (38.5%) applications, a user can "paying per case" in order to "make a blind date, send a message, chat, and others.". In contrast, in 29 (9.1%) applications, a user can "pay some amount of money for the free use of a certain period," and 26 "mixed type" applications (8.2%).

Table 10. Payment Types and Types

Payment Type		Number of Application	Ratio (%)
None		140	44.2
Type	Payment per case	122	38.5
	Fixed	29	9.1
	Mix	26	8.2
Total		317	100.0

We have also looked at how users are offered free points to use the app in addition to paying for it themselves. 'Free points' means that when a user joins another application, providing personal information, the operator can reward a certain amount of points so that the user can be actively using the application. This method indirectly gives the application user the ability to join other applications or to provide personal information. As a result, 91 out of 317 applications (28.7%) were providing free points.

The following Table 11 shows whether the application is advertised and the types of ads it provides within the application. The types of ads in the applications are classified into 'commercial advertising,' 'prostitution advertising,' and 'mixed advertising that provides both commercial and prostitution advertising.'

As a result, the number of applications that provided advertisements was 134 (42.3%). Among these applications, 'commercial ad' 116 (36.6%), 'prostitution ad' 11 (3.5%), and 'mixed ad' 7 (2.2%). These results show that application operators can earn a certain amount of revenue in the form of 'posting commercial advertising' in addition to the payment service, or 'promoting other applications run by the same operator.'

Table 11. Ad Availability and Status

Ad Availability		Number of Application	Ratio (%)
Not Available		183	57.7
Available	Commercial	116	36.6
	Prostitution	11	3.5
	Commercial+Prostitution	7	2.2
Total		317	100.0

In other words, chat applications are making money in various ways. More than half of all 317 applications required payment, and they provided points indirectly by allowing users to sign up for other applications or providing their personal information separately from payment requests. Eventually, application operators could see that they were making a profit from users who use chat applications and other revenue from other companies in the form of information and advertisement.

3.8. Notice of prostitution prevention and enforcement

Table 12. Prostitution Prevention Notice

Prostitution Prevention Notice	Number of Application	Ratio (%)
None	253	79.8
Pop-up form on the first run	32	10.1
Fix warning text at the top	6	1.9
Real-time monitoring and reporting system	3	0.9
Mix	5	1.6
Others	18	5.7
Total	317	100.0

Table 12 is a summary of prostitution prevention announcements on prostitution–related applications. Prostitution Prevention Announcement Status refers to whether a developer is providing (or receiving) information on warnings, surveillance of operators,

reports of users, and other information related to the suspension of activities or postings to prevent prostitution itself.

The analysis found that most apps did not notify any information related to prostitution (79.8%). There are following different types: 1) providing information in the form of a pop-up when the application was first to run (10.1%), 2) presenting fixed warning text at the top (1.9%), 3) providing a 'real-time monitoring and reporting system' for operators and users (0.9%). Also, there were mixed methods (1.6%) and others (5.7%). In other words, out of the 317 applications that provide direct or indirect prostitution information, only 20.2% of applications show that operators are making superficial efforts to prevent prostitution.

Discussion and Conclusion

One of the keywords used when searching for a chat application is that the characteristics of the most frequently used words seem to have nothing to do with prostitution on the surface. It also continues to change with user interest and demand, and operators of chat applications are continually seeking to adapt to this demand. Moreover, the reason the users prefer to obtain prostitution information using a chat application is that anonymity is guaranteed. Most chat applications require a subscription for continued use and activation. However, most users do not require self-authentication because of users who are reluctant to disclose personal information leaks or application experience. The chat application is used as cyberspace to share prostitution information with anonymity.

Besides, the provision of location-based services provides a position between users, allowing users to select a user at a short distance and send a conversation or a message. It provides information about people who are close to physical distance and helps to facilitate a direct meeting. There were cases where additional benefits were provided by providing interworking services to applications and home pages. The homepage linked to the chat application was an 'adult site' that directly or indirectly provided prostitution information. In other words, the nature of chat applications where profitability exists in various ways has been exploited by prostitutes or adult site operators for some profitability purposes.

In the App Store, anyone can easily download the chat application by searching for the desired keyword. The method is straightforward, so there are many users. When we looked at the number of downloads of chat applications related to prostitution, more than half of them had more than 1,000 and less than 100,000 users. The number of users of applications providing direct or indirect prostitution information is vast. The problem is that teenagers can easily access chat applications.

Prostitution promotion applications have been shown to limit the age of use. However, according to the results of the survey, the ratio of '17 years old '(66.2%), '12 years old' (13.2%), '3 years old' (15.5%), '7 years old (4.7%), which allowed almost all of the sex-chatting applications to be downloaded and used without restriction. Notably, some applications set the age of use as 'three-years and seven-years-old,' indicating that setting an age of use is just a formal process and not a means of protecting children and adolescents. Furthermore, there were instances when some of the applications were re-searched (as of October 14, 2016) there was a case that the age restriction was changed

(eg., 12 to 17 years old). In other words, the age setting is not only formal but also easy to change.

Chat applications are fast enough to disappear for various reasons as quickly as new applications are created. Furthermore, some applications changed names for various reasons. It developed an application that provided the same or similar services as the existing application. It migrated all the information in the existing application to provide information for users to use the new application. Moreover, application operators were virtually assisting prostitution. There was a certain percentage (20.2%) of the applications that had been only notifying warning of prosecution/prevention for prostitution. However, they did not crack down on prostitution-related articles. In other words, the operators know that prostitution was practically carried out, but the application still encouraged the situation and attracted users. Therefore, it is not easy to investigate or crackdown on the application itself even if there is a situation in the chat application that promotes prostitution.

In sum, the problem with the chat application is that, firstly, the prostitution is evolving with the development of science and technology. Second, it is difficult to regulate the age of chat applications and to crack down on prostitution. The number of users of chat applications is increasing, and thus various crimes have occurred, but the legal control system is weak. Prostitution agencies or prostitution agencies are already using most chat applications to advertise. However, it is practically difficult to detect the conduct of a chat application operator promoting prostitution and the organized prostitution that exploits it.

However, the current study provides some suggestions for preventing youth prostitution in chat applications in South Korea. First, the chat application used for prostitution has adopted in response to police intervention, changing keywords retrieved by application users, and demand for advertising. Considering the actual situation of applications that are created and disappeared quickly during the investigation period of one month, it is difficult to follow the flow of prostitution into adolescents as a result of postponed concentration. Therefore, it is necessary to minimize the blind spots of prostitution by reflecting the real-time change of cyberspace where prostitution is done by combining techniques such as Search Engine Optimization (SEO).

Second, it is difficult to implement administrative sanctions by punishing administrators of chat applications as 'laws for the protection of sex of children and adolescents or applying the 'Youth Protection Act' to chat applications, despite the public information are being promoted prostitution in chat applications. Therefore, some systems should be provided in the chat application, and if not, registration and operation should be restricted. First, the applications need to remove the users' anonymity within the chat application. When a user needs to sign up for a chat application under their real name, they will not be able to share prostitution information as it is now, because they are concerned about their information disclosure. Also, random chat applications, which provide indiscriminate information on prostitution, should be blocked entirely to the youth through age restriction and strict enforcement or should limit the use time for adolescents. Also, in some applications, screen capture is disabled, and when the other party deletes the chat room, there is almost no access data to the server, so it is impossible to obtain evidence. It is necessary to make it possible to capture all the applications and store the server information for a certain period so that it is easy to acquire evidence when investigating.

Third, complementing the legal side for changes in the sex trade mode in chat applications is required. Currently, the only way to crack down on prostitution through a random chat application is to have a police officer get a note from a chat agent and catch in action to secure evidence about prostitution. However, because the investigation is possible to be illegal due to sting operation, it is difficult to arrest them as a result. It is necessary to introduce a proactive investigation technique such as the United States that can investigate sexual crimes against children and youth in cyberspace. If information related to prostitution is provided in the chat application, users get rewarded a certain amount of money when they report it and have a plan to suspend the operation of the chat application immediately.

Finally, education on harmful media should be strengthened for young people. In the case of teenagers, when they do not have any information, and they use curiosity applications, they can be indiscriminately exposed to prostitution promotional information and obscenity. Also, given the fact that users who use random chat applications become victims of cybercrime, it is necessary to conduct direct preventive education for the youth, the most vulnerable ones. Continuous education is needed to inform the dysfunctional aspect of informatization and to prevent crime damage in school education.

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