Ambivalence about Suicide in Internet: The Correlation between the Search for Negative Information about Suicide and the Provision of Positive Information

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Abstract

Background: Those with suicide ideation are believed to feel ambivalent toward self-induced death. And actual suicide rate is related with the amount of Internet search about suicide in Korea. So people searching for information on suicide methods may still wish to live. Under this assumption, this study investigated the correlation between search of suicide-related words and the number of visitors to Hee-Mang Click (literal translation: Hope Click), a site providing positive anti-suicide information.

Methods: A prospective observational study was done. From August 2010 to October 2013, when five words, "suicide," "suicide method," "how to die," "suicide pact," and "let's commit suicide," were searched in Naver, Korea's top search engine, Hee-Mang Click's banner was automatically displayed at the top of the page first. And we checked whether someone searched for negative words related to suicide clicked the banner to enter or not. The number of clicks was verified using the number of visitors inquiry program, search of five words was provided by Naver Serach Trend and weekly deaths by suicide was obtained from Statistic Korea's statistics on causes of deaths. And we conducted the correlation analysis.

Results: There was a significant relationship between Hope Click weekly visitors and the number of search of "suicide" (r=0.891, p<0.0001***), "suicide method" (r=0.764, p<0.0001***), "way to die" (r=0.718, p<0.0001***), "suicide pact" (r=0.636, p<0.0001***), and "suicide website" (r=0.644, p<0.0001***). And there was also a significant relationship between the number of weekly deaths by suicide and search of "suicide" (r=0.489, p<0.0001***), "suicide method" (r=0.350, p<0.0001***), "way to die" (r=0.356, p<0.0001***), "suicide pact" (r=0.350, p<0.0001***), and "suicide website" (r=0.442, p<0.0001***)

Conclusions: When positive information is offered first to the people who searched for negative words, most of them clicked and verified the positive information. And people who searched negative words related to suicide can be people with a high risk of suicide. In order to prevent suicide, it is important to not only withdraw suicide-instigating information, but also to actively provide positive content on the internet.

Keywords: Suicide; Internet search; Ambivalence

Introduction

According to data from the National Statistics Office, Korea's suicide rate was 28.5 per 100.000 in 2013 [1]. This was the highest among all Organization for Economic Cooperation and Development (OECD) countries, and this rate has been constant for the past 10 years, confirming the severity of Korea's suicide problem through concrete data [2]. The causes of suicide are known to be complex-a mix of individual and social factors-according to many international researches. There is an ongoing effort in Korea to discover the exact cause of the country's sudden rise in suicide rate [3].

In recent years, Internet usage is growing rapidly. The number of Internet users has increased from 44% to 62% in 2011 in developing countries [4]. Especially Korea is one of the most wired countries in the world about Internet usage rate. So Internet penetration of Korea was at 85 percent in 2013[5]. People even in rural areas have gained access to the Internet, and as smart phones have become essential items for daily life, they have become an important medium to obtain information about suicide. And there have been reports about the static relationship between the amount of suicide coverage in newspapers and suicidal thoughts [6]. Similarly, there has been a static relationship between the amount of Internet research about suicide and the actual suicide rate [7].

Generally, people who commit suicide anguish up to the last moment have ambivalence about suicide and it is utilized in suicide prevention programs that deal with high-risk suicide groups [8]. And people who searched negative words related to suicide can be people with a high risk of suicide probably. But there is not known that is there ambivalence in people searching for information on suicide. So the purpose of this study is to confirm the ambivalence in Internet and a high risk of suicide. Our research is as follows: Positive information is offered first to the people who do online research of negative suicide-related information and we investigated whether they clicked the positive information or not. And the correlation between the number of deaths by suicide and search of suicide-related words verified.

Methods

As part of the research method, we conducted collaboration with Naver Corporation from August 2010 to October 2013, the search engine that has 72% of Korea's Internet market share [9]. And when someone searched the following 5 words-"suicide," "suicide method," "ways to die," "suicide pact," and "suicide website"-in the Naver website, we provided positive information by a website banner, 15-20 cm by 8-10 cm in size, at the top of the page(Hee-Mang Click)(Figure 1). And the Hee-Mang Click website banner would be automatically exposed.

Figure 1: A website banner that provided positive information (Hee-Mang Click) in Naver website.

Hee-Mang Click is a website that provides positive information as the testimonies of people who overcame suicidal thoughts, suicide counseling institution and etc. When the banner was clicked, it directed the visitor to the Hee-Mang Click website, and the number of clicks was verified using the number of visitors inquiry program. 283,040 people visited this website and it had an average number of 1675 weekly visitors (SD=424) during the course of this investigation(Figure2).

The number of search of the following 5 words-"suicide," "suicide method," "ways to die," "suicide pact," and "suicide website" was provided by Naver Serach Trend. Naver Search Trend is data that provides the frequency of each word searched in a certain period of time on a weekly basis. It provides data by calculating the highest search frequency as 100 during the chosen period (Figure 3).

The number of deaths by suicide was obtained daily from Statistic Korea's statistics on causes of deaths [1]. And we counted the weekly deaths by suicide.

Data Analysis

The number of Hee-Mang Click visitors, Naver's search trend of suicide-related words and deaths by suicide were processed weekly, and correlation analysis was performed. Data were analyzed using the PASW 19.0 statistics program, and the detailed data analysis methods are as follows:

1) The correlation between the number of visitors and search of suicide-related words were analyzed using Pearson's correlation coefficient.

2) The correlation between the number of deaths by suicide and search of suicide-related words were analyzed using Pearson's correlation coefficient.

3) All statistical significant levels were fixed at 5% for the analysis.
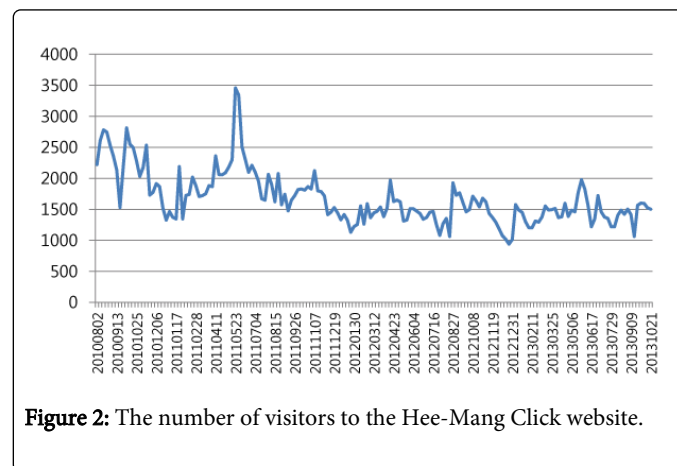
4) We analyzed the data that every record is anonymized.

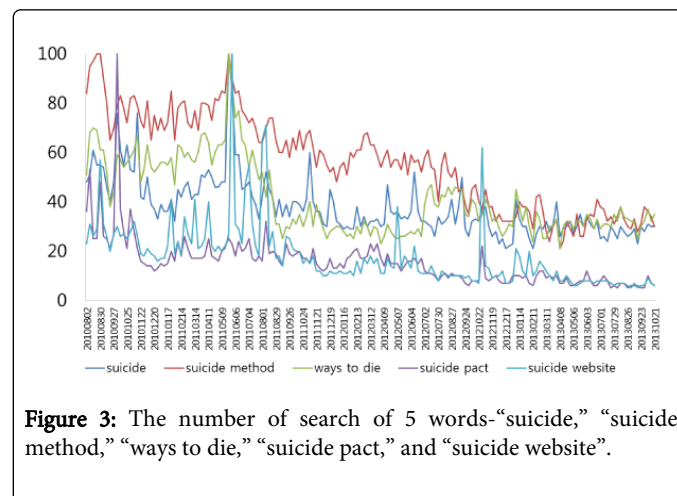**Figure 2:** The number of visitors to the Hee-Mang Click website.

Figure 3: The number of search of 5 words-"suicide," "suicide method," "ways to die," "suicide pact," and "suicide website".

Results

1. The correlation analysis of the number of visitors and search of suicide-related words

The correlation between the number of weekly Hee-Mang Click website visitors from 8/2/2010 to 10/27/2013 and the number of the relevant negative suicide-related search words is shown in Table 1.

There was a significant positive correlation between the number of weekly Hee-Mang website visitors and the search for suicide-related words, and it shows the number of weekly Hee-Mang website visitors is related with the amount of Internet search about suicide. So when positive information is offered first to the people with a high risk of suicide, they clicked the positive information.

2. The correlation analysis of the number of deaths by suicide and search of suicide-related words

The correlation between the number of weekly deaths by suicide from 8/2/2010 to 10/27/2013 and the number of the relevant negative suicide-related search words is shown in Table 2.

	visitors	suicide	suicide method	way to die	suicide pact	suicide website
visitors	1					
suicide	0.891***	1				
suicide method	0.764***	0.785***	1			
way to die	0.718***	0.759***	0.759***	1		
suicide pact	0.636***	0.651***	0.46***	0.674***	1	
suicide website	0.644***	0.639***	0.578***	0.617***	0.539***	1

Table 1: The correlation between Hope Click weekly visitors and search of suicide-related words *** The correlation number is valid to both sides of the $p<0.0001$ level. (N = 169)

There was a significant positive correlation between the number of weekly deaths by suicide and the search for suicide-related words, and it shows the number of weekly deaths by suicide is related with the amount of Internet search about suicide. So people who searched negative words related to suicide can be people with a high risk of suicide.

Conclusions

This study provided positive information when someone searched for negative, suicide-related information via Naver from 8/2/2010 to 10/27/2013 for checking the ambivalence in Internet. As a result, it was verified that the number of search of five words related to suicide-"suicide"(r=0.891, p 0.0001***), "suicide method"(r=0.764, p 0.0001***), "ways to die"(r=0.718, p 0.0001***), "suicide pact"(r=0.636, p 0.0001***), and "suicide website"(r=0.644, p 0.0001***)-were significantly positively correlated with the number of visitors to the Hee-Mang Click website. A similar correlation and pattern was found among all search words, and it means that when positive information was provided in response to negative information related to suicide, there was a standard behavioral response of checking out positive information regarding suicide. And we conducted correlation analysis between of the number of deaths by suicide and search of suicide-related words. It was also verified that the number of deaths by suicide were significantly positively correlated with search of five words related to suicide-suicide" (r=0.489, p<0.0001***), "suicide method" (r=0.350, p<0.0001***), "way to die" (r=0.356, p<0.0001***), "suicide pact" (r=0.350, p<0.0001***), and "suicide website" (r=0.442, p<0.0001***). And we think that it means people who searched negative words related to suicide can be people with a high risk of suicide

Regarding the correlation between the Internet and suicide, Gunnell et al. [10] reported that there was evidence that among 593 people who committed suicide, approximately 2% were directly influenced by the Internet. Similarly, Hagihara et al. [11] analyzed monthly data between Jan/2004 and May/2010 to investigate the correlation of search words related to suicide and suicide rate. They reported that there is a correlation between the frequencies of search words such as hydrogen sulfide and death by jumping from a great height and the suicide rates of people in their 20s and 30s.In addition, a report comparing the frequency of Google search words regarding suicide and data from the Centers for Disease Control (CDC) between 2004 and 2009resultedin a significant correlation between suicide-related search word frequencies and the suicide and self-injury frequencies among individuals between the ages of 15 and 25 [12]. A similar correlation was revealed in Korea when the frequency of suicide-related Google search words and Korea's suicidal rate were analyzed [13]. These results indicate that there is a very high correlation between Internet searches related to suicide and actual suicide rates.

On the other hand, according to the research regarding the relation between suicide and the Internet by Durkee et al. [14], depending on suicidal behaviors, the Internet could have both harmful and positive influences[14]. In the research that utilized Google's search engine, the majority of contents offered under the title suicide were about research and prevention of suicide. However, there was a significant amount of content that went against common medical knowledge and also promoted suicide, which may have increased the negative influences of Internet information on intention to commit suicide [15]. However, when they researched the records concerning online suicide prevention activity between 1997 and 2013, they said some online prevention methods were effective [16].

	Deaths by suicide	suicide	Suicide method	way to die	Suicide pact	suicide website
Deaths by suicide	1					
suicide	0.489***	1				
suicide method	0.350***	0.785***	1			
way to die	0.356***	0.759***	0.759***	1		
suicide pact	0.350***	0.651***	0.46***	0.674***	1	
suicide website	0.442***	0.639***	0.578***	0.617***	0.539***	1

Table 2: The correlation between the number of deaths by suicide and search of suicide-related words *** the correlation number is valid to both sides of the $p<0.0001$ level (N=169)

This research verified the correlation between negative information obtained in suicide-related searches and the access rate to the Hee-Mang Click website, proving the ambivalence that when positive information is given to people who search for negative suicide-related words, the majority of them tendency to access the positive information. And people who searched negative words related to suicide can be people with a high risk of suicide.

In Korea, the main suicide prevention strategy of Internet is only blocking the suicide contents in Internet. However, given that people with a high risk of suicide have ambivalence and commit the act of suicide according to the so-called trigger effect, alternative ways should be considered, not only in blocking negative suicide-related information but also to actively provide positive content on the Internet when someone searched the negative suicide-related words.

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Conflict of Interest

The authors have declared that no competing interests exist.

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