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Research Article

An Analyses of Health-Related Information Using Gambling-Related Keywords

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Abstract

Most individuals have daily, if not constant access to the internet. The increased accessibility of internet use has coincided with an increased availability and social acceptance of gambling behaviours. This trend increases the possibility that gamblers who use the internet as a means to gamble will acquire information on problem gambling online as well. Knowledge about the content and quality of these gambling-related sites will benefit gambling prevention and intervention practices. Thus, the current study aimed to inspect the information on gambling found online using specific gambling search terms. Google and Bing AdWords were used in order to generate the 8 most frequent search terms receiving at least 1,000 global monthly searches. The dataset included the first page of Google search results among five English-speaking countries (Canada, New Zealand, U.K., Australia and the U.S) having the highest reported gambling losses per capita. Descriptive analyses revealed that most gambling-related information online pertained to health-information and help-programs. Further, Health on the Net criteria, a rating scale assessing reliability of health information was used to assess the sites' accuracy. Overall, a mean score of 3.53 out of 8.0was found. Finally, differences by country analyses demonstrated that New Zealand had significantly more help-related program sites than the United Kingdom and the United States. These findings contribute to a better understanding of the nature of gambling-related material online and may impact possible future production of e-health sources of information.

INTRODUCTION

Advancements in technology have resulted in internet services becoming low-cost and globally accessible. Most individuals today have daily if not constant access to the internet. In fact, Lenhart's [1], report examining adolescent use of technology in the U.S, found that 24% of teens 13 to 17 years old are online "almost constantly", and 92% of teens report going online daily. Additionally, middle-age and older adults are also increasingly accessing the Internet on a daily basis. For example, in Canada 48% of individuals 65 years and over reported using the Internet on a daily basis [2]. The accessibility of the Internet is also facilitated by the widespread availability of smart phones. In 2015, 75% of mobile phone owners accessed the Internet through their phone and users of any age are projected to access their mobile browser or an installed app at least once per month [3]. Websites are also very often used as sources of information on health issues [4], and as such there is a need for the information found online to be as accurate as it is available.

The most common way to retrieve all types of information on the internet is through a variety of search engines, with *Google* representing the most popular online search engine in most English-speaking countries. As compared to other search engines, 83% of users reported using *Google* as their preferred online search tool [5,6]. Thus, *Google* may be a primary means for English speaking users to obtain helpful information concerning gambling and gambling behaviours. While the internet presents an effective tool for acquiring and transmitting information, its structure also makes it extremely difficult to enforce quality-control measures. Information found online may not always be accurate and it can be difficult for individuals to objectively judge and assess their quality. As a result, a number of rating tools have been developed in an attempt to evaluate medical and health information-based websites. There is a general agreement on the characteristics of quality health websites including; "quality content, design, aesthetics of the site, readability, dating of information, authority of sources, ease of use, accessibility and disclosure of authors and sponsors [7]. The *Health On the Net [HON] Foundation* is an example of a group that has created a rating system and code of conduct for evaluating the quality of medical websites through the use of criteria that address the above mentioned characteristics [8].

The increased accessibility of health information found online has coincided with an increased availability and social acceptance of gambling behaviours [9]. There has been a proliferation of gambling outlets including online gambling sites which has led to a significant growth in the advertising of different games and

gambling opportunities. Therefore, although health-information has become readily available online, it is possible that online gambling opportunities and advertisements are saturating the Internet and making it increasingly difficult for users to come across helpful information. In a study by Derevensky, Sklar, Gupta, and Messerlian (2010), most youth between 12 and 19 years of age reported being exposed to gambling advertising with several youth specifying that they were bombarded with advertisements while online, specifically through pop-up messages and ads. In fact, 61% of adolescent participants stated they had received spam gambling advertisements by e-mail. These advertisements portray gambling through a glamorous lens, and can often lure individuals by convincing them the resulting lifestyle is easy to achieve [10]. With gambling currently readily available and advertised online, there is an increased risk for problem gambling occurrences. Additionally, the ability to control gambling with age and monetary limits can be extremely difficult online which poses yet another significant risk factor for gambling problems to develop.

Problem gambling prevalence rates are between 1-2% for adults, and estimated at 6-9% for adolescents [11]. However, there is a strong possibility of problem gambling prevalence being higher among Internet gamblers, as research shows that Internet gamblers are significantly more likely to meet criteria for a gambling problem [12]. There is also a significant gap between problem gambling prevalence rates and treatment prevalence, which can be linked to several factors including, stigma, treatment availability and cost [7,13]. Research has demonstrated that barely up to 10% of problem gamblers actually seek traditional forms of help for their gambling-related problems [14-16]. Current public stigma placed on problem gamblers may be lowering professional treatment seeking behaviours, and as a result may be increasing online help-seeking behaviours for gambling. Additionally, Wood and Wood (2009) reported that individuals who already gamble online, are more likely to seek help through online methods. However, web-based health information is often poor in quality, specifically those designed for consumers [7]. Further, a study by Khazaal and colleagues (2008) investigating the quality of web-based information for gambling specifically also found a low quality of information available to consumers. Understanding how easily accessible online health-information is for gamblers, and what information they are consuming is critical to patient-practitioner relationships, patient education, and self-help resources for individuals who do not seek traditional methods of recovery.

Given the likelihood of help seeking information online, and the saturation of online gambling opportunities and advertisements, the current study sought to systematically examine and classify gambling websites by looking at 1. the nature of websites that general gambling search terms bring forth, and 2. The quality of the health information that is being provided by the websites using the HON criteria. This is similar to previous research on non-suicidal self-injury [17], and research that has examined online gambling health-information websites [7]. However, it is the first to our knowledge to systematically classify the gambling websites, without specifically looking for health-information websites, in order to investigate the ease of accessing gambling- related health-information online.

METHODS

Search term and website retrieval

Google AdWords' and *Bing AdWords*' keyword tools were used in order to generate a list of top 30 search terms. Using these keyword tools allows users to establish a baseline list of keyword ideas. Users first enter a word or phrase into the Keyword tools, and the program then provides a list of related keywords along with additional traffic data. Thus, these online keyword tool programs allow users to search terms in order to determine the most prevalent keywords related to the original terms. Two general search terms were used to generate the keywords for this study. Terms initially entered included "gambling" and "gamble". These terms were entered into both *Google AdWords'* and *Bing AdWords'* keyword planner tools in order to generate a baseline list of keywords. Consistent with previous research using only *Google AdWords* [17], the top eight terms receiving at least 1,000 global monthly hits were identified and used to search website results.

The top eight keywords including gambling, gambling addiction, how to stop gambling, gambling help, gambling stories, gamblers anonymous, gambling help, and compulsive gambling were entered into Google ca's search engine. The computer search history was deleted, location tracking was blocked and all cookies were cleared from the computer's browser prior to entering each search term thereby minimizing any previous search history and locations effecting search results. *Google's* search engine provides ten website results per page. The first page of results per keyword were analyzed and classified into nine categories (Table 1). First pages were chosen as users have been shown to focus primarily on the first page of results when using search engines [18,19]. As this study involved the use of websites found on *Google* and all websites are publicly available, no formal ethics approval was required.

Coding rubric

In order to develop a coding rubric the second page of search results was used [17]. The researchers met multiple times to review websites corresponding to the eight final keywords. Analysis of the websites was accomplished using evaluative first cycle coding methods, which led to developing "meta-codes" for similarly coded data through pattern coding methods. These "meta-codes" resulted in nine categories used to code all further websites. We next independently examined 57 websites excluded from the final data set, in order to determine feasibility of the coding rubric. Differences in coding categorization were assessed and the rubric was finalized. The final rubric was tested with the goal of establishing a minimum Cohen's Kappa of .80 interrater reliability, as Cohen's Kappa coefficient is a robust and the most commonly used statistics to test interrater reliability [20]. Finally, the coding rubric was tested on another 57 websites from the first page of search results in a small pilot study, achieving a Cohen's Kappa of 82 reliability, thereby rendering the rubric suitable for analysis with all search terms.

Final codes

During final coding, 10% of websites were coded to determine if interrater reliability was retained; and in fact, agreement

Table 1: Final Coding Rubric.

Codes	Definitions
Health Information	Included quizzes for gambling diagnosis, explanations and/or suggestions on gambling (e.g. DSM-5 criteria for gambling disorder)
Health Program	Introduced programs to stop gambling, selling related stop gambling products (e.g. Gamblers Anonymous)
General Media	Included news articles, movies or TV shows about gambling (e.g. national post news article)
Scholarly	Included scholarly journal articles and academic conferences geared towards gambling (e.g. article in the journal of Gambling Law Review and Economics)
Interactive	Included personal stories about gambling, forums, or questions and responses by different non-professionals (e.g. a personal story of a problem gambler)
Gambling Provider	Included websites that provided locations to gamble, or online gambling sites (e.g. online gambling site, OLGFun).
List of Helpful Sources	Included lists of possible gambling resources available (e.g. yellow page results of therapists)
Gambling Tools	Included strategies and how-to information for gambling (e.g. Super Bowl gambling guide)
Other	Included all irrelevant information (e.g. Wikipedia pages)

reached 86 reliability. Websites were coded into categories which included; Health Information, Health Program, General Media, Scholarly, Interactive, Gambling Provider, List of Helpful Sources, Gambling Tools, and Other (Table 1). A website was coded into *Health Information* when it included quizzes for gambling diagnosis, explanations and/or suggestions on gambling. A website was considered a *Health Program* when it introduced a program to stop gambling, selling related stop gambling products or was part of the Gamblers Anonymous programs. *General Media* included websites that comprised of news articles, movies or TV shows about gambling, while *Scholarly* included websites with scholarly journal articles and reports from academic conferences geared towards gambling. Websites were classified as *Interactive* when they included personal stories about gambling, forums, or questions and responses by different non-professionals. The *Gambling Provider* category included websites that provided locations to gamble, or online gambling sites, while *List of Helpful Sources* included websites with lists of possible resources available in a particular area (e.g., yellow pages with a list of therapists and treatment providers that specialize in gambling problems). Finally, *Gambling Tools* comprised websites that provided users with strategies for gambling, and websites that were either a Wikipedia source or irrelevant information were classified as *Other* (Table 1).

Health on the net criteria

Websites which were coded under the Health Information category were then further analyzed and coded according to the HON rating criteria dichotomously.HON is one of the oldest quality codes of conduct for health websites. In order to obtain HON certification members must apply and pass yearly evaluations for quality of information provided. There are eight HON criteria in which a website must adhere to in order to achieve certification. These criteria include Authoritative, Complementarity, Privacy, Attribution, Justifiability, Transparency, Financial Disclosure and Advertising Policy [21] (Table 2).

Two researchers coded each health information website independently, marking whether each of the eight HON criteria was achieved or not, and 10% of websites were coded by both researchers to determine if inter-rater reliability was above a Cohen's Kappa of .80.Overall HON interrater reliability was .94, with Cohen's Kappa for most individual categories ranging from .80-1.00, except for Justifiability (Cohen's Kappa=.71) (Table 2).

RESULTS

Using the eight gambling-related search terms, 418 web pages were included in the final analyses. Of these, 269 (64.4%) were unique web pages. Different search terms often produce identical webpage results in *Google*. Therefore, the frequency of webpage categories for both unique and duplicate web pages was computed and is presented in (Figure 1). However, to best display the relative frequency of information obtained in search results, all web pages were included in the following analyses. Results indicated that, overall, most web pages were categorized under help-programs (33.4%) or health-information (27.6%). Other web pages were related to media (11.5%; e.g., news reports), a list of helpful sources (10.3%), and interactive interface (8.4%; e.g., forums). The fewest categories included scholarly research web pages (1.2%) and gambling treatment provider web pages (1.7%). Although initially gambling tools was a coding category, only one webpage was identified as such. Further, upon closer inspection the webpage included a news article, therefore this category was collapsed into the category of media (Figure 1).

The second objective of the study was to evaluate the quality of health information provided online. Therefore, both the health-information and help-programs categories were further coded and analyzed using the entire dataset. Health-information web pages were coded for credibility using the Health on the Net (HON) criteria, a widely accepted and referenced rating tools for online health and medical publishers. Additionally, help-program web pages were coded for subcategories. Finally, both health-

Table 2: Health on the Net Criteria.

HON criteria	Definitions
Authoritative	Indicates the qualifications of the author
Complementarity	Indicates that information should support, not replace the doctor-patient relationship
Privacy	Respects the privacy and confidentiality of personal data submitted to the sites by the visitor
Attribution	Cites the source(s) of published information, date medical and health pages
Justifiability	Sites must back-up claims relating to benefits and performance
Transparency	Has accessible presentation and accurate email contact information
Financial Disclosure	Identifies funding sources
Advertising Policy	Clearly distinguishes advertising from editorial content

information and help-program web pages were analyzed to understand country (by domain) differences.

Credibility and HON criteria

Overall, 41.8% of health-information websites were developed and endorsed by a health, governmental, and/or academic institution. The remaining websites did not indicate their endorsing agencies or were endorsed by private institutions. The mean Quality of Health Information score across health-information websites was 3.53 (*SD*=1.86) out of 8. One website, medecinNet.com, met all 8 HON criteria, and it also was a recipient of a HON certification. Closer examination by criteria is presented in (Figure 2). Most websites provided either a contact form or working contacts (Transparency, 89.1%), and an audience privacy policy (Privacy, 82.8%). Just over half of the websites had declared complementarity statements that the information could not replace a doctor-patient relationship (Complementarity, 52.3%). Less than a half of the health-information websites distinguished editorial and advertising content (Advertising Policy, 40%) and even fewer websites disclosed their funding sources (Financial Disclosure, 27.7%). A quarter of the health information websites cited sources when providing advice or information on gambling and indicated the last modified date (Attribution), and 21.5% of websites reported the qualification(s) of the authors (Authoritative). Finally, only 15.9% of websites suggested some form of treatment supported their claims with research evidence (Figure 2).

Subcategories of help-program

The frequency (percentages) of help-program web pages are presented in (Figure 3). A high proportion of web pages did not solely focus on one form of help program or service and as such were categorized under multiple services (29.5%). Further, approximately a quarter of help-program websites introduced a gamblers anonymous organization. The other help-program websites were classified under counselling and/or therapeutic services (16.5%), online support or helpline (12.9%), self-help tools (10.1%), and rehabilitation centre (6.5%). In addition, one webpage (0.7%) was related to a spiritual training program, and two (1.4%) targeted gambling prevention services (Figure 3).

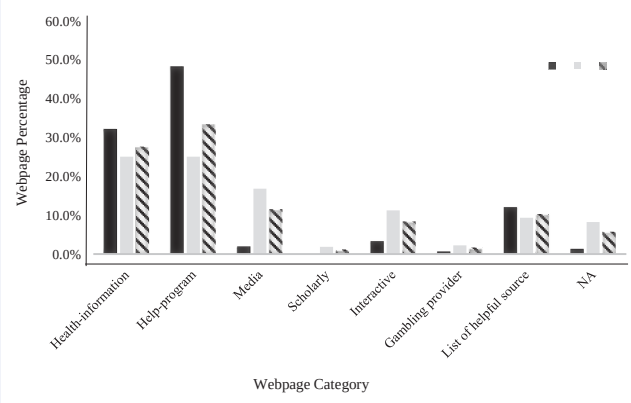

Figure 1 Frequency of webpages by categories.

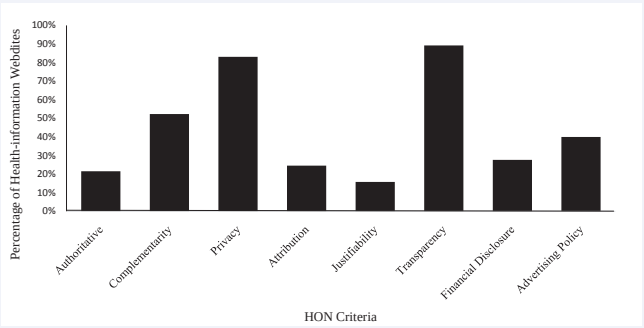

Figure 2 Percentage of HON criteria met by health-information websites.

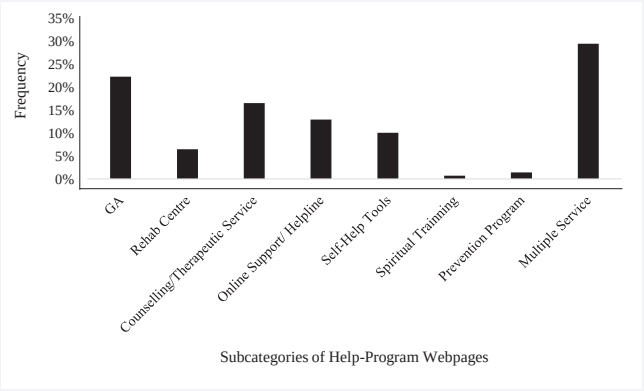

Figure 3 Frequency of subcategories of help-program webpages.

Country differences

It is of considerable interest to analyze differences in frequency of health-information and help-program websites by country. Five English-speaking countries with the highest reported rate of gambling loses per capita were considered in the analysis including Canada, New Zealand, U.K., Australia and the U.S [22]. A two-step process using the entire dataset was applied in order to achieve this goal. First, an omnibus chi-square test was conducted for frequency of each category among countries. Second, if a significant result was found, a partitioned chi-square was used to conduct pair wise comparison between each of the two countries to identify which group differed from each other based upon the frequency of category.

No significant differences among countries was found with regard to health-information, χ^2 (4, N = 115) = 7.86, p>.05. However, there was a significant difference among countries in the frequency of help programs, χ^2 (4, N = 139) = 16.83, p = 0.002. Post-hoc pair-wise comparison was conducted with Holm's sequentially rejective test. Relative frequency of help programs in New Zealand was found to be significantly higher than in the United Kingdom, χ^2 (1, N = 58) = 9.09, p<.005, and in the United States, χ^2 (1, N = 60) = 8.02, p<.005.

DISCUSSION

There has been a worldwide increase in Internet use to acquire information over the last decade, especially with the

introduction of high-speed, low-cost Internet access and newer technological devices (i.e., smart phones, tablets). At the same time, Internet gambling revenues have soared from US$ 2.2 billion in 2000 to approximately US$41 billion in 2015 [23,24].With such widespread availability and saturation of online gambling advertisements and opportunities, it was of particular interest in this exploratory study to examine the kinds of gambling-related websites that can be easily found online.

Using search terms with a minimum of 1,000 monthly searches (n = 8), 418 web pages were analysed. Help-programs and health-information websites were by far the most common types of websites that initially appeared on the first page of search results. This is consistent with previous research on non-suicidal self-injury that also found health-information websites to be among the most common [17]. Given their prevalence, it is most likely that they are the most often accessed by those who search using *Google*. This is troublesome since most of the health-information websites come from questionable sources with only one website achieving a perfect HON criteria score and a mean HON score for all health-information websites of approximately 50%. With such low scores, it is possible that internet users in need of gambling-related health information are being provided with material that is not evidence-based or at minimum endorsed by an academic and health institution/organization. The HON code has also been used to examine online health information in other domains. For incidence, Lewis et al. (2014) investigated self-injury-related online information with HON criteria and also found a low mean quality score for health websites in within that field. Although a high HON score does not necessarily indicate the best quality of content, it serves as an ethical presentation of health-related information, which protects users from unknowingly receiving obsolete or biased information [25].

Due to the high proportion of websites identified as help programs further analyses revealed that most websites introduced a wide variety and diversity of possible gambling help services, with Gamblers Anonymous websites being the second most common. Prevention help-based programs were one of the least found website categories with only two websites identified as such. It is worth noting that the frequencies of categories are heavily reliant on the keywords used. Thus, further research should be conducted using general gambling-related search terms, or search terms that do include the word “prevention” among them.

Further, there were no statistically significant differences in health-information websites among the five English-speaking countries identified. Within the help-based program category, we found that New Zealand had significantly more help-based program websites compared to the U.K. and the U.S., with no significant differences compared to Australia and Canada. With the proliferation of gambling, New Zealand saw a shift in the characteristics of problem gamblers to a broader range of individuals, particularly socially and economically marginalized groups such as immigrants, youth and indigenous and Pacific populations [26]. Given these significant changes the New Zealand government initiated and became one of the first countries to officially declare gambling a public health issue, making it a basis for public policy and legislation [26,27]. Gambling, like smoking and drug use became adopted within a public health framework. This public health model aimed to minimize the negative impacts on individual and communities and may have contributed to increased funding and availability of help-based programs. Additionally, in jurisdictions such as Australia, Canada and New Zealand gambling specific funding is made available through government sources. While this is also the case for the U.S, the U.S. National Institutes of Health (which provides 90% of funding) continues to ignore gambling as a priority in comparison to research on substance-use disorders [28]. This may be contributing to the differences in help-based online program availability between New Zealand, U.S. and the U.K, while no significant differences were noted between New Zealand, Australia and Canada.

Finally, reports looking at population prevalence rates internationally have suggested that New Zealand is one of five (out of 10) countries that has seen significant decreases in problem gambling rates (prevalence studies from 1991-2011 were analyzed) [29]. It is possible that an increased availability of gambling help-based programs *may* be partially contributing to this decrease in problem gambling rates. However, future studies would need to be conducted in order to further investigate this hypothesis.

The current research contributes to problem gambling prevention/intervention practices. Gambling-related health information and help-programs were the two most popular types of websites found online. However, these easily found health information websites did not necessarily have high ethics presentation or content quality. Online health information, like other types of online information, is difficult to regulate, given the nature of the Internet. However, medical and mental health professionals working with individuals with gambling-related problems should be aware that these individuals, their families and friends are most likely accessing online information on gambling with various levels of quality. Further, it is important that health professionals discuss the information obtained by clients and guide them to reliable and accurate health websites. It is therefore recommended that trainings on patient informatics are integrated in health professionals’ education [4].

LIMITATIONS AND FUTURE RESEARCH

This research allows for a greater understanding of the current state of online gambling searches, and specifically the types of websites Internet users are subjected to when using gambling search terms through *Google*. However, this study is only an initial step toward understanding the impact and state of online gambling searches. Several limitations should be noted. First, *Google AdWords* and *Bing AdWords* keyword planners do not generate data for all possible search queries, therefore not all possible gambling searches may have been ascertained. Additionally, it is possible that using other search engines beyond *Google* would provide different search findings. Furthermore, search findings of actual problem gamblers would also be considerably different. As such, future research should investigate webpage results from other search engines and from problem gamblers themselves. It would be of particular interest to investigate what types of help-seeking strategies problem gamblers currently in treatment employed before seeking

professional help, and if there were particular searches, websites or information they were inclined to consume. Finally, in this study we focused solely on English search terms and therefore the results were limited to English web pages. Future research should investigate online gambling searches in other languages/countries as gambling rates are relatively stable worldwide, with an average adult rate of problem gambling across all countries being 2.3% and an average adolescent rate of problem gambling of approximately 5% [29]. Given the significant quantities of health-information and help-based program websites, more extensive information concerning quality of treatment approaches would be expected. However, very few of the health-information websites reported evidence for suggested treatment options. Given, that individuals accessing these sites may be seeking some form of help, the options available may seem relatively few and limited at best. Mental health professionals working with individuals with gambling problems should be aware that patients and families are most likely accessing information online that may not be of the highest quality. Additionally, efforts need to be made in order to enhance the public information provided online and increase accessibility of credible sources. One strategy would be to provide identification of credible health information sources more easily identifiable and create greater awareness for credibility programs such as Health on the Net. Finally, future research should investigate the information individuals require from e-health sources in order to provide them with credible websites that best fit their needs.

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