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ORIGINAL ARTICLE

"Most of the Time You Already Know": Pharmaceutical Information Assembly by Young Adults on the Internet

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This study examined the utilization of the Internet by young adults as a source of information for the misuse of prescription drugs. Collected during 2008–2009, the data presented here comes from semistructured interviews ($N = 62$) conducted in a northwestern city of the United States through support from the National Institute on Drug Abuse. Previous studies characterize young adults as particularly vulnerable to online prescription drug information that analysts portray as having a significant, invariably detrimental, impact on youth drug use behaviors. The results presented here suggest that young adults are more skeptical and information savvy than many substance abuse analysts acknowledge. In addition, knowledge and experiences generated from legitimate medical uses of pharmaceuticals influence individuals' information assessment and evaluation practices employed in the nonmedical misuse of prescription drugs.

Keywords young adults, prescription drug misuse, the Internet, online drug information, risk assessment

INTERNET-BASED INFORMATION AND EMERGING DRUG USE PATTERNS

The misuse of prescription and other drugs among young adults is an emerging public health concern, and a number of observers argue that the proliferation of Internet-based information is influencing this trend. Clinical accounts, for instance, suggest that medically unsubstantiated details regarding the effects associated with recreational drug use are "just a click away" and that young people utilize the Internet to access this information (Wax, 2002). Likewise, other studies emphasize not only the availability of substantial amounts of drug-related knowledge on the Internet, but further argue that this information, characterized by varying accuracy, comprehensiveness, and prodrug use messages, has a potentially significant, invariably detrimental, impact on youth drug use behaviors (Bogenschutz, 2000; Boyer, Shannon, & Hibberd, 2005; Halpern & Pope, 2001).

In this paper, we will not suggest that young people avoid information of dubious medical credibility on the Internet. Instead, we will maintain that members of this group may be more skeptical and information savvy than many substance abuse[1] analysts acknowledge. Young adults exist in a world awash in information; but if our data are any indication, they have developed means to find the most personally relevant material, determine its trustworthiness, and decide whether to use it—or not. For these Internet users, no one source is typically accepted at face value. Instead alternative pieces of information are compared and evaluated against each other as young adults recognize and emphasize how different stakeholders and vested interests can impact the relative reliability of Internet information.

Far from being naïve or uncritical, these young adults use the Internet to actively engage in risk assessment. The ultimate trustworthiness of an information source is not only relative and situational, but also evaluated in terms of the specific drug under scrutiny, the individual constitution, disposition, and past experiences of the person taking the drug, as well as the experience, training, motives, and social position of the person(s) providing pharmaceutical information.

In this paper, we will present results from an exploratory study with the aim of expanding our understandings of how young people use the Internet to access and evaluate prescription drug information—what they look for, how they evaluate it, and what, if anything, they do with it.

[1]The journal's style utilizes the category *substance abuse* as a diagnostic category. Substances are used or misused; living organisms are and can be *abused.* Editor's note.

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TABLE 1. Types of drug websites available on the Internet

Type of information	Name of site	URL
Drug use prevention	NIDA for Teens	teens.drugabuse.gov
	Sara's Quest	teens.drugabuse.gov/sarasquest/index.php
Harm reduction	Drugtext	www.drugtext.org
	Dance Safe	www.dancesafe.org
General surveillance	Office of Applied Studies	www.oas.samhsa.gov
Drug polices	The Psychedelic Library	www.psvchedelic-library.org
	Schaffer Library of Drug Policy	www.druglibrary.org/schaffer/index.htm
Drug control	Drug Information	www.usdoj.gov/dea/concern/concern.htm
	Office of National Drug Control Policy	www.whitehousedrugpolicy.gov
Pharmaceutical misuse	Erowid	www.erowid.org
	Drugs and Drug Use	www.textfiles.com/drugs
	Alt Drugs	www.alt.drugs.dxm
Pharmacology	MedLine Plus	www.nlm.nih.gov/medlineplus/druginformation.html
Pharmaceutical vendors	RX Pill	www.rxpill.com

DRUG INFORMATION ON THE INTERNET

As Table 1 outlines, there is a wide variety of drug-related content available from diverse online sources. This includes general surveillance information, such as that available from the Substance Abuse and Mental Health Services Administration site, as well as web pages directed at drug use prevention including two National Institute on Drug Abuse (NIDA) sites that specifically target youth: "NIDA for Teens" and "Sara's Quest." Other sites provide information framed around a harm reduction approach (e.g., the International Harm Reduction Association's DrugText). At times, these sites target specific youth social groups. For instance, the organization DanceSafe highlights what it sees as less dangerous drug use for the rave and nightclub community. Other web-based sources such as the Psychedelic Library and the Schaffer Library provide online compilations of drug information, including collections devoted to drug policy issues. There are also a number of federal and state sponsored websites, including those provided by the United States Drug Enforcement Agency and the Office of National Drug Control Policy, which offer information related to drug control.

Another category of websites includes those maintained by individuals operating outside governmental or private institutions. These sites provide venues such as chat rooms, forums, and blogs (web journals), where people go to learn about, and share their knowledge of, drugs. An example of this type of site is Erowid.org that has a forum specifically dedicated to pharmaceutical misuse. This site and others (e.g., textfiles.com/drugs) are locations where individuals share information on a range of topics, including recommended dosages, costs, effects, routes of ingestion, strategies to gain prescriptions for specific drugs from health care providers, techniques to increase the potency of drugs, delivery methods for online prescription drug orders that are less likely to draw suspicion from authorities, guides for buying prescription drugs in Mexico, and diaries of drug use experiences. Other Internet-based drug information communities include Usenet newsgroups such as alt.drugs. In addition, numerous sites provide pharmacological information on prescription drugs. These include the National Institutes of Health MedLine Plus site, as well as sites sponsored by commercial interests. The latter include online pharmacies that not only provide drug information but also a means to purchase prescription drugs as well (e.g., Rx Pill). The range of sites available speaks to the great volume and variety of prescription drug information available on the Internet. A recent search for the keywords "prescription drug information" on Google (http://www.google.com/), the most used search engine on the Internet, resulted in over 2,870,000 hits.

The Internet has garnered attention not only as a source of drug-related information but also as a means to access drugs themselves through online pharmacies—a putative and commonly scrutinized origin of prescription drug diversion. Various stakeholders, including drug misuse prevention researchers, policy makers, and public officials, characterize Internet pharmacies with drug war rhetoric as aggressive "pushers" who direct prescription drugs to even the most vulnerable buyers with little or no effective oversight (Center on Addiction and Substance Abuse [CASA], 2004). These alarmist depictions are uncritically circulated and amplified in the news and other popular media, where headlines spotlight the dangers posed by these "rogue" pharmacies (Krebs, 2007). At times, these representations may distort the relationships between the Internet and actual pharmaceutical misuse. The Internet accounts for a very small amount of diversion—only 0.1% pain relievers (one of the most commonly misused class of pharmaceutical in 2006), for instance, were procured through this medium (National Survey on Drug Use and Health [NSDUH], 2007).

Other research adds greater dimension to our knowledge regarding the relationship between the Internet and drug use among young people, but still reveals gaps in our understandings to the extent that these investigations do not uncover a great deal regarding how young people actually evaluate and utilize the information they find on the World Wide Web. There are, for instance, content

analyses of website images, features, and messages that focus on a range of drugs, from tobacco to hallucinogens (Montagne, 2008; Ribisl, Lee, Henriksen, & Haladjian, 2003), but these investigations tell us very little regarding how people actually access and evaluate this information, let alone how they use it. And while more technically oriented Internet usability studies (Eysenbach & Kohler, 2002; Hansen, Derry, Resnick, & Richardson, 2003) provide insights on website features and designs that make information accessible and user-friendly, they neither illustrate what specific types of content are actually sought by young people nor do they provide the motive and purpose behind their searches. Those studies that go beyond content to examine more directly social and interactive features of the Internet and how they relate to young people's drug use provide insights on drug information exchange and the development of online drug identities (Murguia, Tackett-Gibson, & Lessem, 2007) but do not attend to issues regarding how such information is accessed, evaluated, or utilized.

In addition, there is an extensive and growing amount of literature regarding pharmaceuticals and other drugs available on the Internet, alongside claims that this proliferation of information is related to drug use trends in youthful populations. And yet, existing research does not consistently lay bare the relationship between information and practice. Such an explication is particularly warranted; we need to be critical of alarmist accounts and examine the extent to which these representations reflect real trends, while at the same time being mindful that these analyses and commentaries linking drug use, the Internet, and youth (Katz & Rice, 2002; LaRose, Lin, & Eastin, 2003) tap into and exploit latent perennial psychosocial fears in American culture regarding the reach and penetrability of new technologies, young people's trustworthiness and morality (Kelly, 2003; Springhall, 1999), and the quintessential boogey man of drug use (Goode, 1990; Musto, 1999; Stein, 1990).

METHODS, RECRUITMENT, AND ANALYTICAL PROCEDURES

The data presented here come from 62 semistructured interviews conducted through support from the National Institute on Drug Abuse (R21 DA019858). The sample had an average age of 21 years, predominately male (55%), college enrolled (73%), and reflecting the demographics of the study region, almost exclusively white (98%). Although this research meant to examine the utilization of the Internet by young adults as a source of information for the misuse of prescription drugs, it was clear that in many instances individuals sought, evaluated, and utilized the same sets of information (e.g., effects, side effects) for both medical and nonmedical purposes. These interviews consisted of a written list of questions and probes that provided a structure that ensured the coverage of important research topics while allowing interviewers the flexibility to follow leads or explore areas of interest that emerged in the context of the interview (Bernard, 1994, p. 205). Questions focused on the range of information young adults access related to prescription drug use and included anticipated outcomes, synergistic effects with other drugs, and possible risks associated with the use of prescription drugs. Interviewers also investigated these domains through an exploration of informants' most recent prescription drug use experience, including attention to the social context and outcomes of use. Portions of these interviews were organized around "grand tour questions" (Spradley, 1979) and focused on the social contexts of prescription drug misuse including settings, events, personae, time, duration, sanctions, behaviors, and interactions. The interviews, which were audio recorded and took on average an hour to complete, also elicited information regarding the perceived outcomes, both positive and negative, of nonmedical prescription drug use, including the effect of drug use on role performance, social interactions, and health. The general foundations of the interview questions were empirically based—they were developed as exploratory queries directed toward project research objectives. The interviews were pretested with six individuals, after which project research personnel debriefed and discussed the interviews and slightly revised the interview guide (e.g., rewording, reordering of some items, and the addition of probes).

Recruitment procedures included the use of advertisements, flyers, and snowball sampling. Recruitment ads ran in a student and local newspapers, and flyers were distributed on campus as well as at student social venues (e.g., bars, coffee shops, and restaurants close to campus). The ads asked for young adults (18–25 years of age) interested in sharing their knowledge and attitudes about the Internet and drug use and noted that eligible participants would be compensated for their time. A phone number was included in the ad that individuals could call to learn more about the project and to be screened for eligibility. At the conclusion of their interview, participants were asked if they knew of other likely candidates for research participation. If they responded positively, they were asked to notify up to three people they knew by providing them business cards with a telephone number they could call to learn more about the project. Each card had a unique identification number so that referral chains could be documented to control the types of chains recruited and number of cases in any particular referral chain.

The individuals who responded to these efforts were screened systematically for eligibility utilizing a purposive sampling procedure. In order to meet participation criteria, an individual had to be 18–25 years old, a prescription drug misuser (defined as past year use of one or more prescription drugs without a prescription from a doctor or use that was contrary to a doctor's direction), and gone online at least once in the last year to search for health-related information. All recruitment and research procedures were reviewed and approved by an institutional review board, and all participants provided written informed consent to be interviewed for this project. Participants were compensated with $20 for completing an interview.

Young adults were selected as a focus of this study for several reasons. Existing research makes clear that the cultural expectations related to social age in this population segment influence behaviors and conceptualizations of risk related to drug use. This period of "emerging adulthood" (Arnett, 2004) is characterized as a crucial period of transition and experimentation characterized by new freedoms and a lack of roles and responsibilities that come to structure later adult social life (e.g., marriage, child rearing, career) (Bachman et al., 2002; Backett & Davison, 1995; Jessor, Donovan, & Costa, 1991; Schulenberg, O'Malley, Bachman, Wadsworth, & Johnston, 1996). This life phase often includes the first independent living experience; increased courtship, dating, and sexual experiences; and drug use behaviors.

At the same time, young people use the Internet more than any other age group. Sixty-nine percent of 9- to 17-year olds used the Internet compared with only 37% of individuals of 50 years of age and older (United States Department of Commerce [USDOC], 2002). Data from a Henry J. Kaiser Family Foundation study (2001) indicate that 90% of 15- to 24–year-olds have gone online. Significantly, online youth also utilize the Internet as a source of health information—75% have used the Internet at least once to find health-related material. Likewise, large segments of this group have used the Internet to research depression or mental illness (23%) and drug- or alcohol-use-related problems (23%). The Internet provides an important medium for accessing health information with characteristics that make it particularly attractive to young people, including accessibility, confidentiality, interactive features, relevance, and accuracy (Borzekowski & Rickert, 2001; Eng, 2001). Gray, Klein, Noyce, Sesselberg, and Cantrill (2005) note that the Internet is attractive to young people seeking information on health issues because it effectively combines positive characteristics found in other lay and professional information sources with personal and impersonal interactive features. Young people like being able to find a wide range of information on any given health topic quickly and conveniently and perceive that Internet information is the most up-to-date information available.

Audio recordings of the interviews were transcribed and, after transcription, coded using Nvivo 8 (Qualitative Solutions in Research [QSR], 2009). This software allows researchers to code interview transcripts and to sort, arrange, and access data in a variety of ways. Preliminary coding and analysis focused on examining the range of patterns and themes related to general drug use, prescription drug misuse, and the evaluation of drug-related information on the Internet. Analysis followed an approach whereby a descriptive coding scheme was developed from transcripts based on specific questions and broader domains from the interview. In the context of the research presented here, pattern coding was employed to highlight themes relevant to prescription drug misuse and Internet use (cf. Miles & Huberman, 1994).

This analytical procedure allowed the researchers to systematically organize and examine results to each of the interview questions. These responses were then subjected to other specific coding procedures. Coding was conducted at multiple conceptual levels with general themes and categories being derived from more basic words, statements, and utterances. Individual responses were coded for each of the questions asked. Next, each of these question level responses was coded for more specific replies at a word or statement level. The results of these two steps in the coding procedure were sets of words or statements organized within question level categories. Finally, each set of words or statements was examined and semantically identical responses collapsed into a single code. Codes within each question category were then reexamined to determine if they could be collected together under a more comprehensive category or theme.

In the following presentation of results unique numbers (e.g., 2–047) represent individual respondents.

RESULTS

Young adults report using the Internet to seek out a wide variety of prescription drug information. Generally, they become curious about a pharmaceutical either because they (or a relative or friend) are using it for a legitimate medical purpose, or they come across it in a social setting. They then use a search engine (typically Google) or a specific website (e.g., WebMD, RXlist, Erowid) to look for information. They report being interested in details regarding risks and side effects, indications and drug effects, identification, dosage and price, as well as the recreational potential of certain pharmaceuticals.

Risks and Side Effects

Interviewees were most interested in using the Internet to determine and evaluate the risks and side effects associated with pharmaceuticals. These individuals see the Internet as an efficient means to survey any dangers associated with the use of particular prescription drugs. Young people use the Internet not simply to determine a drug's effects, but also to ascertain the capacity of the drug to produce harm, most often conceived of in terms of physical damage to the body or addiction potential. The following passages typify this category of responses.

> Basically I look for the side effects . . . how much it takes to have certain effects and if there is going to be any long-term effects that can possibly be damaging. 2-027

> [I look for] long term effects. Like with pain, a lot of pain medications may cure less if you abuse it a lot. I'm not interested in that. Vomiting, that sort of thing, I avoid. I'm okay with a basic inability to drive <chuckle> or operate heavy machinery. That's okay with me, generally. And then I look for the effects, like personally, I typically do downers, barbiturates of some sort, slower things, like grass or alcohol or pain pills. But I'm always on the look-out for a better speedy drug. I like the sensation of speedy drugs, but they all seem so negative in the side effects. 2-047

As the second passage illustrates, at times the evaluation of risks and side effects is quite deliberate and elaborate. It is directed toward misuses and includes

consideration not only of generally recognized medical effects, but also more idiosyncratic preferences and dispositions.

Indications and Drug Effects

Alongside information regarding risks and negative side effects, young adults are also quite interested in ascertaining details regarding indications and clinical effects of pharmaceuticals. Individuals want to know what a particular prescription drug is supposed to do, what it is used to treat, and what medical effects it has:

> The only information that I've ever looked for is just a description of the effects. Just a basic [description of] what the job is. Side effects, or not side effects, but, you know, effects. What it'll do to you if you're using not for prescription use. I've only done that for like Adderall and stuff, but that stuff comes from word-of-mouth anyway. It just kind of reinforces what you already know. It's nothing new or ground-breaking. 2-022

Another interviewee noted similar motivations:

> [I look for information] just to make sure. Like I have had gastroenteritis, which is just stomach flu basically and we had some medication. I typed it in to see if it would work with gastroenteritis or leave it alone or not touch it. 3-019

It is important to note that this type of information seeking is not confined to medical use of pharmaceuticals, but extends to social-recreational uses as well. In fact, knowledge regarding medical effects and uses associated with a particular pharmaceutical can suggest other avenues for information seeking and drug use trajectories as individuals apply knowledge they gained from medical use of pain relievers such as Vicodin, for instance, to subsequent socio-recreational opportunities. Young people are not only evaluating the medical effects of legitimately utilized prescription drugs, but their recreational potentials as well.

> Well a lot of times if I have been prescribed drugs that I had every intention of using as they were prescribed, but I also have looked on there [the Internet] for more information about it; what people had written, personal experiences, testimonials and that sort of thing. And then also, I've used other sites when I've been curious about what misusing a prescription drug would do, what kind of risks and benefits there were. 2-047

Thus, the Internet provides a convenient medium to confirm what they think they already know about a pharmaceutical from other sources.

Assessment of Recreational Potential

The Internet is also utilized to make general assessments of the recreational potential of certain pharmaceuticals. Individuals are interested in determining what is "good" to use as well as what they might wish to avoid. These types of calculations are more than simply identifying prescription drugs with recreational capabilities; they also involve a desire to gain information regarding the potential impact of different dosage levels and mode of ingestion. This includes consideration of the particular benefits or risks associated with ingesting a pharmaceutical through an alternative method (e.g., crushing and snorting Ritalin as opposed to taking it in a standard oral manner) as well as potential interactions with other drugs. A 25-year-old male noted that he looked for "what kind of pills you can snort," while a 20-year-old male reported "I (look up) side effects—hazardous side effects. What not to mix and what drugs can possibly be used for recreation."

Other results suggest that young adults utilize the Internet to engage in risk assessment. They are interested in pharmaceuticals that exhibit recreational potential, but at the same time do not wish to consume a drug that does not seem reasonably safe—they wish to engage in a type of risk taking within limits:

> If I am going to experiment with anything, I kind of look it up first, just to see if everything is okay. 2-008

> I just wanted to make sure it wasn't anything that I shouldn't have taken. Make sure the side-effects wouldn't effect me, or . . . I mean I know they can affect anyone, but it wasn't something I was too familiar with so I wanted to make sure I wasn't doing anything that was too bad. 2-010

Another type of risk assessment and management involves the use of the Internet to identify or verify a pharmaceutical's identity and effects. This comes about when an individual does not discover a prescription drug through legitimate medical channels, but by other sources, and wishes to use a prescription drug for a recreational purpose. In these circumstances, an individual will seek to learn more about a pharmaceutical's potential, including effects, side effects, and risks, especially when combined with specific recreational drugs (e.g., combining Vicodin and alcohol). This typically involves scenarios where individuals obtain a pill from some source, usually a friend, and then utilize the Internet to verify its identity. This process is facilitated by the fact that many pills have information on them (e.g., letters, numbers) that provide simple, effective search terms. One 21-year-old male simply noted:

> If somebody gives me something and I don't know what it is I type in the information on it, the numbers and letters. Never take anything when you don't know what it is! 3-001

Information regarding the effects to be expected from combining a particular pharmaceutical with other substances is also sought. One 25-year-old male reported:

> A lot of times if someone has a generic pill, I will look it up to see what it is. Or if they think they know what it is I will look up, like to figure out, you know, the dose the pill contains. And then in the past I have looked up, like just to see what stuff you are not supposed to take or match, mix and match and then also to see like, what kind of pills you can snort. 3-002

Assembling Information From Multiple Sources: Assessment and Action

Given the emphasis placed on the Internet as a key component in drug abuse activities among young adults, it is important to note that some individuals do not rely solely on this medium but utilize and evaluate multiple sources

of information as they triangulate and collate data to create a foundation for their actions through a chain of research, reasoning, and assessment. One interviewee, a 19-year-old woman, described how she engaged in such a process:

I would look up on Drugs.com all the time things that people were giving me . . . interactions. I would look up if I was taking certain opiates to make sure I wasn't taking something else. Mostly I would go to Walgreens right up the street from my house that's (open) twenty four hours and I would ask the pharmacists and this is great I would ask them "If I take three OxyContin and I had been drinking a little bit would that be a bad reaction?" "Well, it would be like if you take like this, this and this." Yeah it was kind of funny <laughs>. 2-051

Thus, while there are real risks involved in pharmaceutical misuse, some young people utilize the Internet and a range of other sources in an attempt to engage in harm reduction and otherwise manage their drug taking. The following passage, from a 25-year-old woman, illustrates this sort of process:

I try to combine information. The Internet is so easy because it's- I have Internet at home, and I would love to own a bunch of books, but I really don't. And there used to be a bunch of used books stores around town and I would browse through, but, a lot of them have gone out of business. 2-012

A different interviewee emphasized the utility of the Internet when investigating new drugs:

Every once-in-awhile I like to get on the Internet and if I heard about a new drug or whatever on TV or a friend or whatever. I like to do research on it and this can include, usually just a Google search and you can find a whole bunch of different, legitimate medical information on it, say like coming from a government site, or something like that. And of course you will get, occasionally you will get like the social blogs, and those can be insightful too. 2-031

Another noteworthy topic of interest concerns the circumvention of surveillance and monitoring procedures associated with drug testing regimes:

Just this weekend I looked at, if they would show up on a drug test. Like, what, yeah, specifically if Vicodin would show up on a drug test. Um, yeah there was some, I guess. <laughing> They tell you like what to do to get it out of your system and stuff and like, that it would take like seventy-two hours. 2-023

As noted, it is clear from the literature that there is a great deal of drug-related information available on the Internet—what is less well known is how this information is evaluated and utilized by individual drug users. Young adults exist in a world awash in information. If the currently considered data are any indication, they have developed strategies to find the most relevant information and determine its trustworthiness. Myriad sources offer information—popular media (including news and advertisements), personal social networks (made up of friends and family who often have both indirect and direct experience with a particular pharmaceutical of interest), and a variety of medical professionals (such as doctors, nurses, pharmacists). Add to these the information available on the Internet from government sources and strangers and it is worthwhile to consider just how young people make sense of it all, what sources they trust the most, and why.

Given these considerations, young people employ a mix of skepticism and curiosity as they utilize and critically evaluate a range of sources. One 25-year-old woman noted how she approaches the range of information available:

I guess they can all tell you different things. The Internet, I feel like it's- there's stuff that's not true but there's a lot of information so you can look at a ton and then decide on how much you hear. And then friends, I mean I would assume that if they take it—I would trust their information about what they've taken, not necessarily what they've heard, because I don't really trust some people saying they've read something unless I've read it myself. 2-002

Young people rely on a variety of sources of information to provide clues to them during their assessments. The source of web-based pharmaceutical information is important—government and educational sources, indicated by the sponsored top level domains.gov or.edu, are generally considered more reliable than.com designated sites that many believe are subject to the commercial interests and biases of prescription drug manufacturers. But no one source is typically accepted at face value and alternative pieces of information are compared and evaluated against each other. One 19-year-old young man described this process:

Some universities put out studies that get discredited quickly. I never trust just one site exclusively, like if I was going to look up information on anything, I would have to see it on more than one site, more than one website before I actually start accepting that as being the truth. So I would check if I was looking for some drug website. I would look up; check what the university has to say about it and what the company itself has to say about it. 2-006

Another young adult emphasized how different stakeholders and vested interests can impact the relative reliability of Internet information in the following way:

Well it all depends on certain websites; it just depends on the source. I guess it would have to depend on it . . . like I think I have been to some website where there is honest information. Like vendors won't tell you much. And state agencies or schools . . . they can only tell you so much without being liable. 2-005

It is also important to note that informational needs can be very specific to an individual, and as a result the search for information and the evaluation of its usefulness and veracity is also very particular. What this means in specific terms is that in many cases the search for information requires that an individual cross-check a variety of sources and ultimately rely not solely on the Internet but on relevant personal and secondhand experiences as well. As a 24-year-old woman noted:

I guess the Internet could go both ways. It could be the most reliable. I would take what I read on the Internet and cross-check it with the health care provider and probably, family and friends, I mean I trust my family and friends <chuckling>, it's that every case is different, and so it's not necessarily that they're not trustworthy, but it might not be the same, for myself, as what their experiences were with an illness or drugs. 2-009

Another individual reported:

I wouldn't use it (the Internet) as a sole source. I mean I don't trust it that much to believe everything it says. I would talk to other people and different health care providers. I just kind of use it for general sense of what people are saying about it. I wouldn't trust it very much. 2-012

Thus the ultimate trustworthiness of an information source is relative and situational and evaluated in terms of the specific drug under scrutiny. For instance, several interviews referenced these types of points by citing the example of physicians as sources of pharmaceutical information. Overall, these individuals noted that while medical doctors are generally highly educated, extensively trained, and in the possession of a great deal of biomedical knowledge, they were at the same time subject to important time constraints and pressures from the pharmaceutical industry that could influence their prescribing practices. In addition, others pointed out that a physician could not be easily approached for certain types of information that was important to them, including questions dealing with the recreational potential of particular pharmaceuticals and the effects of mixing of pain relievers with alcohol.

These circumstances, along with the fact that different doctors give dissimilar opinions on health-related topics, meant that young adults set out to find sources to fill informational gaps. Friends and others with personal experience taking a particular drug are especially recognized as important resources to achieve this end. In this way, objective medical knowledge is considered important, but so too are more subjective reports. Ideally, "hard facts" could be effectively compared with "real experiences" in order to give an individual a considerable range of information with which to formulate an opinion and perhaps even a course of action. As a 21-year-old woman summarized:

[It's that way] pretty much with anything though, you know? You look up something and, and you read about it. [It's like] you're looking for a sweater, if it'll fit you! It's your size. So you put it on and wear it. And then you really know what's going on. Food, anything, you know what I mean? 2-038

Individuals reported a number of motivations underlying their information assembly. They do not always expect that they are getting the most complete or accurate information from their sources, be they friends, family, or even medical professionals. The Internet is valued because it provides a means to access a wide range of information and allows young adults the ability to explore, evaluate, and verify or refute initial assessments derived from these other information sources. One interviewee reflected:

I think it's reliable in that there's an opportunity to have the full range of viewpoints, especially with something like drug use where there are totally different opinions. So I think that would be the best source to get a real gauge on, like the fastest- it would be the fastest and easiest way to get it, to gauge the general outlook, as well as you can, and take all of those different sources and kind of go where you want with that. 2-022

Thus, the Internet serves as an important tool with up-to-date information to assemble sources, verify or refute reports, and indicate avenues for further research and action. In spite of this utility, however, it is not necessarily the sole or even the most authoritative source utilized by young adults.

DISCUSSION

Young adults seeking Internet-based information regarding pharmaceuticals engage in an iterative gathering and assessment process as they triangulate and compare a variety of sources and experiences on a number of attributes, including relevance and trustworthiness. In this section, we would like to underscore some of the more important implications and avenues of future research suggested by these results.

The first point we will highlight concerns the influence of legitimate medical use experiences on individuals' knowledge, understanding, information assessment, and evaluation practices. Many young adults have substantial experience, both direct and vicarious, with a range of pharmaceuticals including pain relievers, antidepressants, sleeping aids, allergy medications, antibiotics, and antianxiety agents. This is borne out in our interviews as well as larger scale, population-based surveys that indicate increases in prescription drug use and misuse (Friedman, 2006; Monitoring the Future [MTF], 2007; NIDA, 2001; Poulin, 2001).

This includes cases where individuals had fairly extensive interactions with mental health professionals and as a result had tried different antidepressant medications and experienced a number of side effects as they learned, evaluated, and settled on a particular one. In the process, some individuals have more extensive experience with pharmaceuticals and report information needs that are fairly sophisticated. They are particularly interested in risks and side effects associated with consuming medications, their indications and effects, and, at times, their recreational potential; they typically assemble information from multiple sources, assess this information, and use it to inform their actions. They are also interested in subjective accounts that are not typically provided by doctors or drug manufacturers.

This finding is noteworthy for two reasons. First, it demonstrates that medical and recreational uses of pharmaceuticals interact and inform each other in heretofore unacknowledged ways. These modes of use often encompass legitimate medicines used with illicit drugs or for nonmedical purposes. Young people access complex, overlapping medical and socio-recreational domains of knowledge, practice, and experience. This includes assembling pharmaceutical information on risks as well as potential efficacy for both medical and recreational purposes. One implication of this situation is that it may be imperative to expand the current scope and emphasis of research to expand beyond one type of recreational user seeking one type of information as if this form of use

and the information seeking activities associated with it are separate from medically oriented practices. Instead, it is important to examine medical and recreational information assembly in relation to each other. Young adults assemble and make use of medical information and take what they learn and how they learn and apply it to recreational activities.

Second, it is important to consider the wider cultural context that may be influencing patterns and practices. The process of overlapping knowledge assembly and information assessment takes place within a cultural milieu of pharmaceuticalization, a form of medicalization whereby prescription drugs are assertively created and marketed to address more and more quotidian issues, conditions, and states of being (Rose, 2003; Williams, Seale, Boden, Lowe, & Steinberg, 2008). This includes the development of pills targeted toward ambiguously defined diseases (Lane, 2008; Wolf-Meyer, 2009; Woloshin & Schwartz, 2006), the regulation of lifestyle and behavior (Conrad & Leiter, 2004; Singh, 2004), performance enhancement (Talbot, 2009), and the medication of heretofore normal physiological processes associated with senescence (Potts, Grace, Gavey, & Vares, 2004). These developments invite several questions in light of the data presented here: How is the proliferation of pharmaceuticals and pharmaceutical advertising influencing how young adults access and evaluate information? There are several interrelated issues to consider: (1) the extent to which the saturation of messages from media and marketing impels individuals to be more critical evaluators and consumers of information; (2) the importance of personal experience in filtering these messages; and (3) the role of the Internet in providing a world of information at one's fingertips in making sense of a social setting awash in pharmaceuticals.

Another important point concerns the implications of these findings for those that seek to emphasize, and perhaps even sensationalize, the negative influence of the Internet on youth drug use dynamics. In contrast to existing accounts that suggest that young people uncritically utilize Internet-based information, many of the individuals interviewed for this project were skeptical of even apparently reputable biomedical sources. They recognize doctors as being generally trustworthy but realize that these medical professionals are fallible, have differing opinions, are sometimes influenced to prescribe by pharmaceutical companies, and may not wish to answer nonmedical prescription drug-use-related questions for fear of liability. As a result, young adults must rely on a variety of other channels for information.

Rather than viewing the Internet as harboring a host of potentially dangerous information that is "just a click away" awaiting unreflective use by young people, we suggest instead that the situation is both more complex and much more interesting. Young adults may not be seeing one bit of information and then acting on it but instead hold this information up against other sources and constantly reconsider and reevaluate in the context of the latest information and new sets of experiences.

At least some young people appear to be critical, rational consumers of information—their searches are thought out and the information gained is not necessarily put into practice. And while not dismissing the real problems that a relatively small minority may have with pharmaceutical misuse, the analysis presented here should be encouraging to public health practitioners and drug misuse preventionists to the extent that young people are looking for sound information. Thus, the data presented here should caution against a too simplistic picture of the Internet as some sort of uncomplicated informational boogey man—a source of inaccurate, unsafe information that is too easily accessed and uncritically examined and utilized by young adults.

These intricate forms of information assembly and evaluation also pose greater methodological challenges for those interested in systematic research on young adult drug and pharmaceutical use in a technological age. Large-scale surveys, for instance, typically query respondents regarding the extent to which they rely upon or trust various forms of media (Hesse et al., 2005; Hutton, 2006; Kohring & Matthes, 2007). Our research suggests that information assembly derives from many sources and the veracity and usefulness of this information is highly dependent on context, including intended use, previous experience, and personal constitution. It is important not only to ask people who they trust, but why they trust and rely on a source regarding a particular drug for a specific use, at a particular time, and for a distinct medical or recreational purpose. Along these lines, it would be helpful to have studies that more closely examine how technologies and information are accessed and utilized by individuals over time. This requires moving beyond content analyses and usability studies to investigate in more contextual detail the information young people actually search out—not simply what information is available. These types of investigations will entail scrutiny of how people evaluate and utilize content. This means that when it comes to analysis and research practice, we must recognize young adults as skeptical, sophisticated consumers of information and approach them accordingly.

The results presented here also have implications for various frameworks in new media and innovation adoption studies, particularly health and digital literacy theories. Health literacy explicitly examines how individuals seek out, understand, and utilize health-related information and highlights the implications these processes have for intervention development. This framework describes factors that influence the ability of individuals to obtain and interpret basic health information and services in ways that enhance health and facilitate health service encounters (Ratzan & Parker, 2000). These factors are particularly relevant to Internet use—several studies consistently note that young people experience difficulties managing the volume of health information they are exposed to on the Internet, judging its quality, and often lack sufficient search skills (Gray et al., 2005; Hansen et al., 2003; Skinner, Biscope, Poland, & Goldberg, 2003).

But one limitation of health literacy and other current theories as they are applied to understanding how

people use the Internet is that this medium is fundamentally different from any other that has been available previously, with features and capabilities that allow consumers to access and use information differently than they ever have before. For young people in particular, issues such as credibility, anonymity, and social interaction take on different meanings when they are online. Much of the current theory in this area conceptualizes communication and persuasion as a very linear process, and this may not accurately capture how young adults find, evaluate, and use web-based prescription drug information. In addition, characteristics of the Internet may require a set of specific skills and competencies that are different from, or more elaborate than, those needed for other mediums. This "digital literacy" includes the ability to make informed judgments regarding the veracity of online information, mastery of searching skills, and the capacity to integrate diverse sources (Gilster, 1997). As newer and different technologies are more fully integrated into the social lives of young adults, it becomes more important to develop deeper understandings of how they use these devices and applications to inform their activities.

Our results suggest that some young drug users are digitally literate—they are individuals who possess not only technical skills that allow for such activities as efficient searching, but who also engage in a particular way of thinking, information evaluation, and knowledge generation. The existing literature on the Internet and drug use does not examine digital literacy in this sense but instead characterizes users with a fairly broad brush.

These observations point to some very important limitations of many current drug education and prevention programs directed at young people. As one recent review highlights, the development of school-based drug prevention programs has come to a point where we now have a number of tested, theory-based programs (Botvin & Griffin, 2007). By and large, these programs focus on teaching social refusal and resistance skills and critically evaluate misconceptions regarding normative drug use and do not recognize or develop digital literacy skills. Instead, up to this point in time, there has been a focus on using the Internet and associated media and technologies as platforms for disseminating and delivering drug prevention, education, and treatment, but probably too little focus on how young adults are actually using the medium in the ways we have described here.

Conceptualizations of health literacy may provide some guidance. Some health literacy programs, for instance, emphasize processes that we describe here—an engagement that is more than simply being able to read a medical pamphlet and successfully schedule an appointment with a physician. Programs developed with these goals in mind teach people to make more effective use of information, emphasize different forms of communication and information, and, overall, go beyond functional literacy to encompass more interactive forms of literacy that increase an individual's capacity to apply information and experiences to new situations and settings (Nutbeam, 2000). In other words, these programs seek to foster a critical literacy that provides more active control and analysis of information and how it may be applied to an individual's specific circumstances.

Study's Limitations

Finally, it is worth underscoring several limitations of this study before proceeding to the conclusion. The individuals who participated in this investigation may not be representative of young adults in the United States who utilize the Internet for pharmaceutical information. The methodology employed in this study does not allow us to determine what specific individual traits or characteristics are associated with particular types of judgments, evaluations, or uses of information. Likewise, the study design did not capture the external factors and processes that enable and/or interfere with making accurate and beneficial choices. In addition, this research shares the limitations of all qualitative studies. It provides rich information regarding individuals but does not offer generalizable conclusions concerning larger groups and populations that are also important. Because this research targeted a relatively small segment of the population, this investigation offers limited external validity. Therefore, the findings revealed in this research may not apply to other groups. Likewise, the data protocols developed as part of this study may have limited applicability, although probably not much less than those generated for use with other special populations. In a related way the uniqueness of the study—its population, research context, timeliness, and overall methodology—in many ways precludes it being replicated and thus raises issues of reliability. Although the results provided here are not widely generalizable, they do shed light on real life experiences and provide descriptions of how some young adults evaluate and utilize Internet-based information regarding prescription drugs.

CONCLUSION

A considerable amount of information regarding prescription drug use is available on the Internet, and several observers have suggested that this information has a straightforward, negative influence on pharmaceutical misuse and amplifies emerging drug use trends. These accounts of an inexorable, unilineal pathway from one type of knowledge to use, ignore the complexity of multisource, polypurpose information gathering and evaluation that is taking place.

Furthermore, these accounts look to reports of recreational prescription drug use for confirmation of poor health and digital literacy. Certainly observational studies have found these literacies wanting among Internet users (Eysenbach & Kohler, 2002; Hansen et al., 2003). However, within accounts such as these is the tacit assumption that if sufficiently digitally and health literate, risk-averse young adults would abstain from recreational drug use and other unhealthful behaviors.

In contrast, the work presented here suggests that recreational drug use should not be conflated with, or serve as an indicator of, poor health and digital literacy. Many accounts portray young adults as Internet savvy, aware of,

and able to navigate, the great store of information available on the web, without being "information wise," and able to distinguish and make accurate judgments about information. But these accounts imply that if young adults were more prudent, they would reach the same conclusions about the veracity and utility of web content as information experts and health care professionals.

Our data found that young adults may be sophisticated and discerning in their online searches and still use drugs recreationally. Furthermore, the data presented in this study suggests that the traditional metrics used to assess digital and health literacy may not be relevant when examining the search patterns of young adults seeking information on the recreational use of prescription drugs. The indicators of quality health information used by analysts, such as the presence of web quality seals (Eysenbach & Kohler, 2002), affiliations with medical professionals (Griffiths & Christensen, 2005), and recommendations of health care experts (Morahan-Martin, 2004), may not be particularly useful in the search for information on recreational prescription drug use.

Additionally, when attempting to find this information, sites endorsed by health experts may themselves be considered suspect by young adults. These sites are considered spurious for a variety of reasons. Medical websites can be hypercautious and afraid of liability, drug company information seeks to protect the image of a product and therefore does not provide content on recreational use, and governmental pages are considered informed by antiquated drug war dogma.

This is not to say that inaccurate information is not being disseminated, used, and acted upon by the individuals in this study. But contrary to alarmist rhetoric that paints young adults as gormless victims beguiled and misled by the web's spurious drug content, our research suggests that at least some young adults are discerning consumers of medical information. The data presented here should caution against too simplistic a focus on the Internet as a source of inaccurate and dangerous information that is too easily accessed and uncritically examined and utilized by young adults.

Additionally, these sophisticated consumers of web content understand that they are not always getting the most accurate information from particular online sources. The Internet is valued precisely because it provides a means to access a wide range of information that allows young adults the ability to explore, evaluate, and verify or refute initial assessments derived from these other information sources. The Internet may be awash with apocryphal drug information but that does not mean that young adults are swallowing what is put before them without due consideration and evaluation.

Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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GLOSSARY

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