

EVALUATION OF RISK PERCEPTION ASSOCIATED WITH ONLINE PHARMACY USE

John Hertig PharmD, MS,* , Chelsea Anderson PharmD, MBA, BCPS*, Catherine Scott, CPHQ,*
Kathryn Marwitz PharmD, MPH,** Kiersten Walters PharmD,** Jackie Wasynczuk PharmD **

Introduction: There are an estimated 32,500 online pharmacies worldwide selling prescription medications to patients, of which 96% are operating illegally. Decisions to purchase from online pharmacies may be influenced by perception of risk. Current research suggests that specific socioeconomic characteristics and current health status may predispose individuals to accepting or rejecting risk. Therefore, it is important to determine these potential predictors that encourage use of online pharmacies despite perceived risks.

Methods: A standardized, 49 question survey via phone was conducted by a contract survey research firm to collect data from 500 Indiana consumers regarding online pharmacy use, perception of risk with online pharmacy use, and relevant demographic information.

Results: One-third of those surveyed had purchased from an online pharmacy for themselves or for someone under their care. Females and males over the age of 55 were most likely to have purchased from an online pharmacy and those with the lowest household income were most likely to accept perceived high risk associated with online pharmacy use. Finally, of those who purchased from an online pharmacy, over half received a referral from either a physician, nurse, and/or pharmacist.

Conclusion: There are identified associations between demographic characteristics or health status and online pharmacy risk perception and risk acceptance. Further research should be explored to determine the impact of these characteristics on risk perception.

Introduction

There are an estimated 32,500 online pharmacies worldwide selling prescription medications to patients.¹ While online pharmacies are prevalent, knowledge pertaining to legitimacy, legality, and safety for these establishments are lacking.² In assessing the legality of these websites, there are several factors to consider, including if the

pharmacy is operating where it dispenses medications, if the pharmacy requires a valid prescription, and if the drugs are approved for sale within the shipping destination. Out of these online pharmacies, 96% are found to be operating illegally.¹ Separate from the criminal implications of illegally operating online pharmacies, there is a public health concern regarding the quality of medications supplied. The World Health Organization speaks to the risks of purchasing medicines from online pharmacies. These risks include no guarantees that the product supplied is what was ordered, where the product is manufactured or stored, as well as if the seller

*Affiliated with Purdue University College of Pharmacy Center for Medication Safety Advancement, Fishers, IN.

** Regulatory fellows with Purdue University College of Pharmacy, West Lafayette, IN.

is authorized to dispense these products.³ Additionally, it has been shown that healthcare providers may not be adequately trained to help patients navigate these online sites when determining their legality.⁴ Therefore patients may be using these illegal online pharmacies without knowledge of any resources to keep themselves safe.

Current research suggests that specific socioeconomic characteristics may predispose individuals to accepting or rejecting risk. Nicholson and colleagues demonstrated that risk-taking was inversely related to age in six different risk domains: recreational, health, career, finance, safety, and social.⁵ Additional research demonstrates that factors such as gender and income influence risk perception. Females, especially older females, tend to avoid risk except those with higher income tend to engage in more risk when that risk has to do with monetary gain.⁶ When considering risk in general situations, risk aversion is a common theory used to describe individuals opting for choices that carry less risk, even if that means receiving less reward. In contrast, risk neutral individuals are more likely to make choices without considering the amount of possible risk involved. Gupta and colleagues investigated which individual (risk-averse or risk neutral) would be more likely to use online shopping. While it is likely that online shopping carries more risk, similar to using online pharmacies, the investigators were not able to determine that risk neutral individuals were more interested in online shopping over risk averse shoppers. However, the investigators did note that once a risk averse shopper picked a shopping method, they were more likely to remain loyal to that method, despite the risks.⁷

Online pharmacies are prevalent and decisions to shop online may be influenced by

perception of risk. Therefore, it is important to determine the potential predictors that encourage continued use of online pharmacies despite known potential risks.

Methods

DESIGN

The objective of this analysis was to determine whether socioeconomic factors or health status influenced willingness to accept perceived risks associated with purchasing from an online pharmacy.

SETTING AND SAMPLE

A phone and electronic survey of registered Indiana voters was conducted from May 18th to May 23rd, 2017. The list of potential participants was obtained by *Baselice & Associates, Inc.*[†] who also conducted the survey. Participants were selected from three designated market areas (DMA): northern, central, and southern Indiana. Survey participants were excluded from participation if they: were not registered voters in the state of Indiana, were employed in the news media, worked for market research firms, were an elected official, or were actively involved with political campaigns. A total of 500 respondents were interviewed and included in this analysis. Participants were also given the opportunity not to respond to each question in the survey.

PROCEDURES

A standardized, 49 question survey was employed to collect data on online pharmacy use by consumers. The survey questions were developed by an expert panel

[†]*Baselice & Associates, Inc.* is a national research organization with experience in public affairs, corporate research, and legal research.

Table 1: Demographics of Respondents

Demographic	N (%)
Gender (n =516)	
Female	275 (53%)
Male	241 (47%)
Age in years (n=496)	
18-44	163 (33%)
45-54	89 (18%)
55-64	97 (19%)
65 and older	147 (30%)
Annual Household Income (n=447)	
Below \$40,000	98 (22%)
\$40,000-\$79,999	179 (40%)
\$80,000-\$124,999	113 (25%)
\$125,000 and over	57(13%)
Distribution of Interviews DMA (n=500)	
Northern DMAs	175 (35%)
Indianapolis DMA	221 (44%)
Southern DMA	104 (21%)
Online Product Purchase (n=495)	
About once a week	95 (19%)
About once a month	125 (26%)
Several times a year	95 (19%)
Only a few times a year	100 (20%)
Never	80 (16%)
Social Media Use (n=500)	
Daily	220 (44%)
A few times a week	65 (13%)
A few times a month	40 (8%)
Less than once a month	35 (7%)
No social media use	140 (28%)

Demographic	N (%)
Interviewee Perception of Health (n=495)	
One (poor)	10 (2%)
Two	25 (5%)
Three	125 (25%)
Four	205 (42%)
Five (excellent)	130 (26%)
Number of prescriptions (n=490)	
One to Two	140 (29%)
Three to six	130 (27%)
More than six	55 (11%)
None	165 (33%)

before conducting the survey. After ensuring eligibility, respondents were asked about their current use of online pharmacies and baseline perception of risk. Respondents were then presented with educational information regarding the risks associated with online pharmacy use and their overall risk perception was reassessed. Finally, baseline demographic information was collected for all respondents including gender, age, annual household income, geographic area, social media use, history of online shopping, perception of personal health, and number of current prescription medications.

Results and Discussion

DEMOGRAPHICS

The baseline demographics of the survey respondents are described in Table 1. Of the respondents, 47% were males and over

half were 54 years old or younger. Twenty-two percent of survey respondents had an annual household income of less than \$40,000 whereas 13% of respondents made equal to or greater than \$125,000 annually. These baseline demographics are similar to Indiana’s general population data, with the exception of more individuals aged 65 years and older.⁸ Thirty-five percent of participants resided in northern Indiana, 44% in the central Indiana area, and 21% in southern Indiana.

Overall, 19% of respondents reported shopping online about once a week, 26% reported shopping online once a month, and 20% reported shopping online just a few times per year. Forty-four percent of respondents reported using social media daily, whereas 28% of respondents did not have any social media accounts.

When assessing respondents’ perception of health, they were asked to rate their health on a 5-point scale with one being

poor and five being excellent. Two percent of respondents rated their health as poor and 26% rated their health as excellent. Thirty-three percent of respondents self-reported taking zero prescription drugs, whereas 29% reported taking one to two prescription drugs, 27% reported taking three to six prescription drugs, and 11% reported taking more than six.

ASSESSING PERCEPTION OF RISK

Survey respondents were asked to describe their perceived risk associated with purchasing medications from Canadian online pharmacies (Figure 1). Risk was self-defined by each survey participant and responses pertained only to Canadian online pharmacies. Overall, 38% perceived Canadian online pharmacies as risky, 47% as not risky and 15% of respondents felt that the risk of Canadian online pharmacy was dependent on some other factor or they refused to answer this survey question.

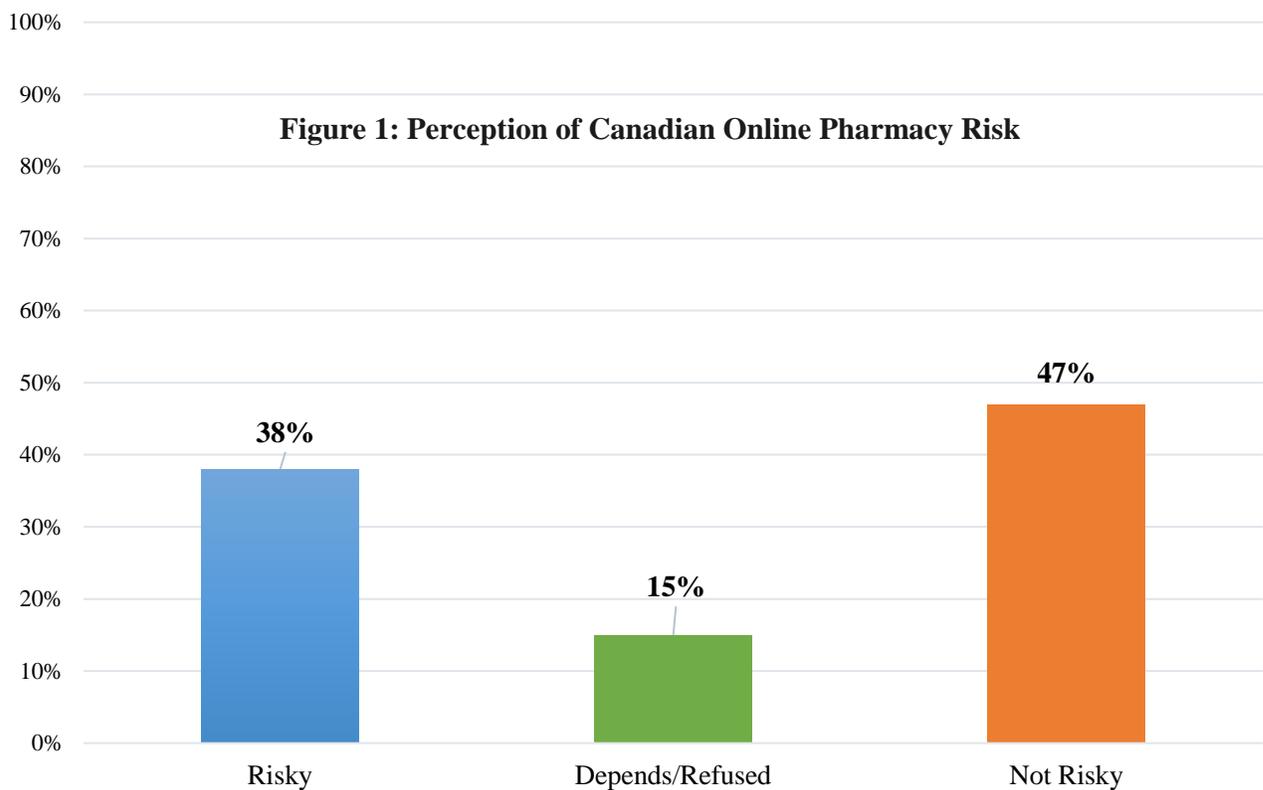


Table 2: Demographics of Respondents for Risk Perception

Demographic	N	Risky n (%)	Not Risky n (%)	Depends/Refused n (%)
Total		38%	47%	15%
Age				
18-44 years old	163	50 (31%)	90 (55%)	23 (14%)
45-54 years old	89	34 (38%)	45 (51%)	10 (11%)
55-64 years old	97	35 (36%)	45 (46%)	17 (18%)
65 years old	147	65 (44%)	56 (38%)	26 (18%)
Current Health				
One to Three	159	76 (48%)	60 (38%)	23 (14%)
Four	204	71 (35%)	106 (52%)	27 (13%)
Used OP* before				
Yes	167	53 (32%)	87 (52%)	27 (16%)
No	333	133 (40%)	150 (45%)	185 (55%)
Assess Canadian OP* as less expensive than US pharmacies				
Yes	228	73 (32%)	146 (64%)	9 (4%)
No	75	37 (49%)	34 (45%)	4 (6%)

Risk perception by demographic category is summarized in Table 2. Results suggest that younger individuals were more likely to describe use of Canadian online pharmacies as not risky. This may be due to better overall health and less knowledge of the potential dangers of prescription medications obtained from Canadian online pharmacies.

Most of the individuals who rated their health as one to three (48%), described Canadian online pharmacy use as risky. Comparatively, a majority who rated their health as four out of five (52%) rated Canadian online pharmacies as not risky. This pattern may be related to the trend observed in the age demographic. As discussed above, younger individuals tend to be healthier and may underestimate the risks of using

*OP= online pharmacy

prescription medications. In turn, they may feel more comfortable purchasing medication from an unfamiliar source online.

For those who had previously used any online pharmacy, 52% rated Canadian online pharmacies as not risky. For those who had never used an online pharmacy, 45% rated Canadian online pharmacies as not risky. This finding is similar to the findings seen by Gupta and colleagues.⁷ They observed that risk averse participants remained loyal to a shopping method, regardless of the actual risks involved, provided that they had successfully used that method before.

Finally, when stratified by cost, those who perceived Canadian online pharmacies as less expensive were more likely to describe online pharmacies as not risky (64%). Those who did not consider Canadian online pharmacies to be less expensive were slightly more likely to describe them as risky (49%). Therefore, individuals who believe Canadian online pharmacies are less expensive may also perceive less risk associated with their use.

PAST USE OF ONLINE PHARMACIES

One-third of surveyed Indiana voters had purchased from an online pharmacy for themselves or for someone under their care. Females and males over the age of 55 were most likely to have purchased from an online pharmacy making up 29% and 27% of purchasers, respectively (Table 3). In addition, those reporting a household income of \$40,000-\$79,999 were the most likely to buy from online pharmacies making up 45% of purchasers. Respondents taking three to six prescription medications were the most likely to purchase from online pharmacies making up 38% of that demographic group.

Table 3: Past Use of Online Pharmacies by Demographic Characteristic

Demographic	N (%)
Age/Gender (n=165)	
Male/Under 55	33 (20%)
Male/55+	45 (27%)
Female/Under 55	39 (24%)
Female/55+	48 (29%)
Annual Household Income (n=148)	
Below \$40,000	21 (14%)
\$40,000-\$79,999	66 (45%)
\$80,000-\$124,999	40 (27%)
\$125,000 and over	21 (14%)
Age/Income (n=152)	
18-54 years/under \$80,000	41 (27%)
18-54/\$80,000 and over	28 (18%)
55+/under \$80,000	50 (33%)
55+/\$80,000 and over	33 (22%)
Number of prescription medications (n=165)	
None	35 (21%)
One to two	45 (27%)
Three to six	62 (38%)
More than six	23 (14%)

ASSESSING REASONS FOR USING AND FOR NOT USING ONLINE PHARMACIES

Survey respondents were asked to provide their reasoning for or against use of online pharmacies. Online pharmacies were not defined for the survey respondents and respondents were allowed to provide more than one reason to support their opinions. In regards to reasons for using an online pharmacy, respondents expressed that they are less expensive and convenient to use (Figure 2). Participants also indicated that their insurance plans required use of online

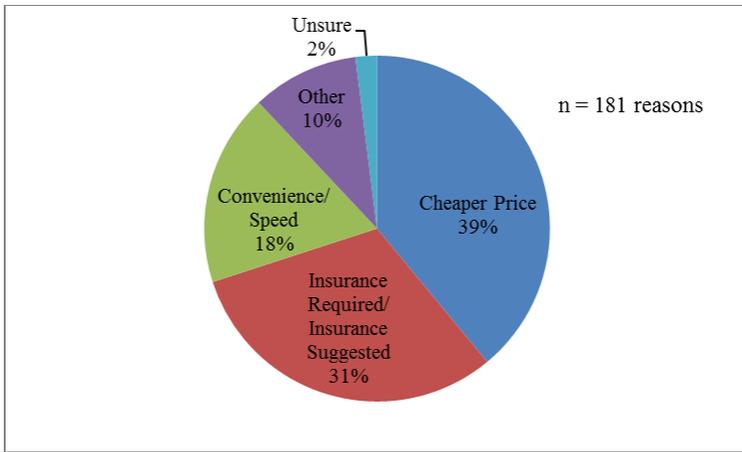


Figure 2: Reasons cited for using an online pharmacy

pharmacies. It is thought that this insurance requirement may indicate use of online refill systems or mail order pharmacy. Figure 3 provides the reasons indicated for not using an online pharmacy. These included disinterest or personal pharmacy preference, distrust, inconvenience, limited understanding, and not taking any prescription medications. Many respondents expressed enjoying going into the pharmacy for their prescriptions. For example, one participant said, “I have a personal relationship with my pharmacist and I like them.” In assessing these reasons, it appears

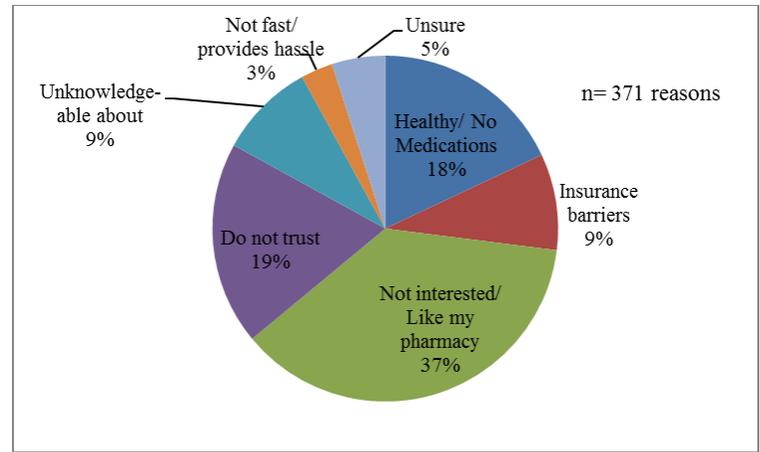


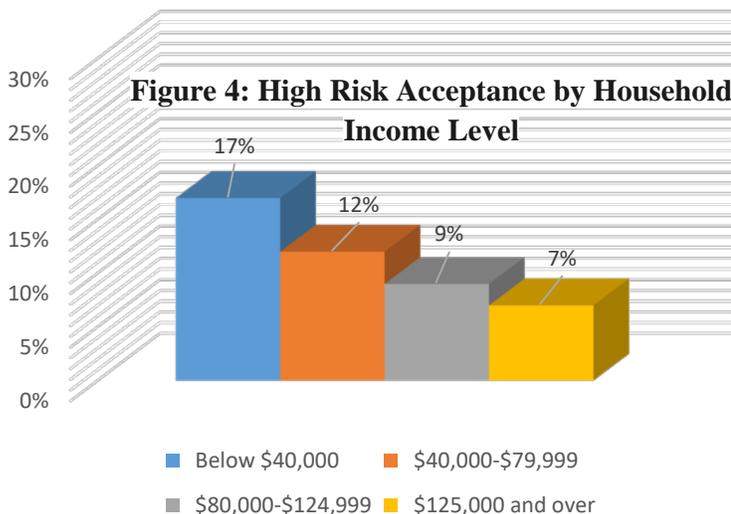
Figure 3: Reasons cited for not using an online pharmacy

that pharmacy consumers are influenced by cost, convenience, and personal pharmacy preferences and these factors should be taken into account when developing appropriate policies and interventions.

ASSESSING ACCEPTANCE OF RISK BY HOUSEHOLD INCOME

After determining perception of risk, participants were surveyed on the amount of risk they would be willing to accept when using an online pharmacy. Figure 4 illustrates the percentages of participants willing to accept high risk within each income bracket.

The willingness of those in the lower income brackets to accept high risk may be explained by the reason provided earlier, that individuals often turn to Canadian online pharmacies for less expensive medications. These individuals may be more inclined to accept risk in exchange for the benefit of cost savings. Furthermore, low-income individuals may be more apt to take on risk because they may be less familiar with the actual associated risks.⁹ These individuals thereby stand to lose an opportunity to



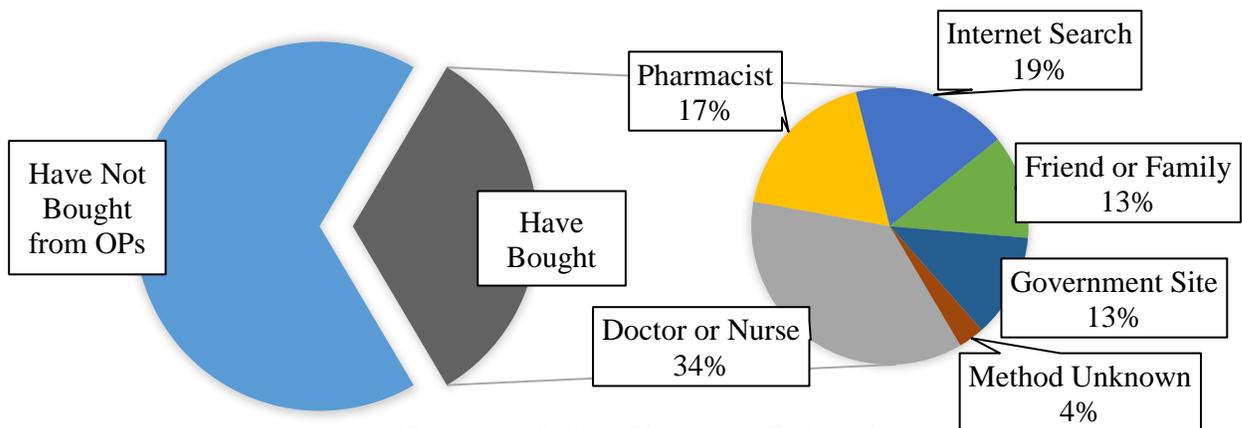


Figure 5: Online Pharmacy Referrals

improve their health if they do not try an online pharmacy but might also respond to education about the inherent risks of online pharmacy use, if provided.⁹

ASSESSING USE OF ONLINE PHARMACIES AND ACCEPTANCE OF RISK BY REFERRAL STATUS

Respondents who purchased from any online pharmacy were asked about their resources for finding those online pharmacies as described in Figure 5. Of the 33% of respondents that had previously purchased from an online pharmacy, over half received a referral from either a physician, nurse, and/or pharmacist. One respondent commented, “The only time I would do it would be if the doctor recommended it, and so far they have not done that.” When patients are referred by trusted healthcare providers, they may perceive online pharmacies to be less risky. Thus, education targeted to healthcare providers likely influences online pharmacy users.

Limitations

While the findings in this survey data inform educational interventions and policy, there are some limitations. This survey only included individuals who were on the voter registration list in Indiana and excluded a number of individuals as mentioned previously. Although these results are not generalizable to Indiana residents, there are important findings relevant to the perceived risks associated with online pharmacy use and demographic characteristics. This survey also collected gender information by perception of the surveyor making it more difficult to draw conclusions regarding the implication of gender on the study findings.

Furthermore, the use of survey methodology relies on self-reported data for assessing the perceptions and information gathered in this study. These data provide insight into which factors may influence risk perception regarding online pharmacy use but cannot be used to establish certain causality.

Conclusion

There are identified associations between demographic characteristics or health status and online pharmacy risk perception. For example, the acceptance of high risk in households with low income; a finding that should be further explored.

Additional questions within the survey were conducted, but not included in the analysis. These questions found that individuals may be persuaded on both perception of risk and willingness to buy from illegal online pharmacies. While the responses indicated that informing respondents about the risks may persuade these respondents, further analysis is needed to better understand the magnitude of influence.

Overall, the potential impact that healthcare providers have on patient's perception of risk creates an opportunity for intervention. More education is needed to ensure these interventions alter patient risk perception and increase patient use of safe, legal online pharmacies.

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