

# Prevalence and correlates of childhood obesity in suburban area of Odisha: a cross sectional study

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## ABSTRACT

**BACKGROUND:** The use of over-the-counter (OTC) drugs has increased tremendously, however, information on risk perception regarding the use of OTC drugs and their potential toxicity is scarce. Hence, the purpose of this study was to investigate the perception of OTC drug safety and efficacy based on reading product packaging and the effect of race, education, age and income. **Methods:** We used the HINTS 2012 data set with total sample size of 2,554.

**METHODS:** We used the HINTS 2012 data set with total sample size of 2,554.

**RESULTS:** OTC drug users having some high school education had a lower chance of frequently reading information included in the product labeling with the OTC medication. OTC drug users less than 50 years of age were always likely to read drug information on the OTC drug labeling. Also, Non-Hispanic blacks were more likely to read OTC drug labeling than Non-Hispanic whites. OTC drug users less than 50 years of age consider OTC drugs safer than prescription drugs. Conversely, OTC drug users with a high school, some college or bachelor's degree consider OTC drugs less safe than prescription drugs. Non-Hispanic blacks, non-Hispanic whites, and subjects of lower income were less likely to consider OTC drugs safer than prescription drugs. OTC drug users with a high school education and some college perceive OTC drugs to be less effective than prescription drugs.

**CONCLUSIONS:** To conclude, age, education, race, and income affect risk perception on OTC drugs. Consumer information programs need to be designed so that meaningful results can be incorporated into public policy. Providing information on the labeling of OTC drugs and likelihood of patients reading this information require further study.

*Key words: Risk Perception, OTC drugs, Race, Education, Income*

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## INTRODUCTION

Over-the-counter (OTC) drugs are approved and regulated by the United States Food and Drug Administration (FDA) and

can be purchased without a prescription. In 2011, the FDA reported that more than 100,000 OTC drugs are approved in the U.S.(1). The most common OTC drugs purchased in the United States include analgesics and

antipyretics, cough, cold and allergy products, gastrointestinal medications, and nicotine replacement therapy (1).

The FDA reviews the active ingredients and labeling of over 80 therapeutic classes of prescription and OTC drugs (1). More than 600 drugs were changed from prescription-only medicines to OTC drugs over the past two decades (2). The advantages of OTC drugs include wide availability, patient autonomy, government savings on health care, and increase in market share for pharmaceutical companies (3). The main concern of deregulation of drugs is patient safety, but this could be overcome by providing better drug information to the patients (4, 5). Due to the wide range of products available, each with attractive packaging which may be misleading for patients, product selection becomes overwhelming. In addition, active ingredients are not always clear to consumers secondary to multiple active and inactive ingredients listed on the product packaging (6). Information on perception of OTC drug safety and efficacy for patients based on their age, race, ethnicity, and educational level is important to develop and target appropriate educational interventions for OTC drug safety (7).

Due to the movement of drugs from prescription-only to OTC status and poor economic conditions prevailing in US, availability and use of OTC drugs has increased rapidly (8). In the US, about 35% people use OTC medication regularly (9). Females and the elderly are more likely to use OTCs and almost half of older adults were using an OTC drug concomitantly with a prescription drug (9, 10). Self-care can lead to misdiagnosis, potentially neglecting serious health conditions, and risk of adverse drug interactions (11-14). Patients of lower socio-economic status are more likely to take OTC medication resulting in increased risk of overuse of OTC drugs (15, 16). Prior to presenting to emergency departments (ED), patients commonly use OTC analgesics (17) and reported exceeding the maximum recommended daily dose (17). Interestingly, most patients were aware that overuse of OTC analgesics could lead to adverse events, which suggests that patients disregard the risks of OTC drugs (17-19). Thus, it is important to understand the risk perception of individuals towards the use of OTC drug.

The use of OTCs by children and adolescents increases with age (20-23) with

adolescents' self-medication prevalence ranging from 25% to 92% (20, 21, 24) which contributes to almost 60,000 emergency department visits annually (25). Appropriate use and abuse of OTC drugs is concerning in adolescents (26). Based on their own experience as a child and parental self-care approaches, adolescents and young adults develop their own information for management of health (27, 28). The lack of knowledge about correct use of analgesics and associated risks has been shown to lead to inappropriate use (29, 30). Further, it may lead to inappropriate self-care, unwanted side effects, and risk of toxicity (31). Significant improvement in OTC drug label literacy was observed after student pharmacist-led education among 8th graders who were self-medicating with OTC drugs (26).

Consumers need to be informed about medications to avoid adverse events and increase safe and appropriate use of OTC drugs. Information on the product packaging provides useful safety information about OTC drugs, but does not advise about drug, alcohol, or food interactions or maximum doses (1). Although the duration of OTC use has been associated with serious adverse events, such as gastrointestinal bleeding with non-steroidal anti-inflammatory drugs, reading additional information about OTC analgesics has not been shown to increase the intention to safely use the medication (32, 33).

Since OTC drugs are commonly used, more attention should be given to processes that explain the patterns of OTC drug use. After controlling for gender and lifestyle, television advertisements encouraged OTC analgesic use (34). These results suggest that use of OTC drug is affected by other factors such as stress and socioeconomic conditions. There was a significant and direct association between perceived stress and OTC use (35). Since stress is associated with lower socioeconomic status (36) it would be interesting to investigate the association between OTC drug use and socioeconomic status. The few studies that have evaluated the association of OTC drug use with socioeconomic status have inconsistent results (8). Tobi, et al, identified differences in OTC drug use based on socioeconomic status and gender in adolescents (37). Another study did not find any association between OTC medication use and socioeconomic status after adjusting for health status (38). In this study

the relationship between the risk perception of OTC drugs and socioeconomic status will be examined. One study found that 70% to 90% of all illnesses are handled by some form of self-care and are not brought to the attention of a health professional (39). Without the advice of a health professional, misuse of OTC medications is widespread (40). Thirty percent of survey respondents reported at least one measure of misuse of a nonprescription medication (41) and 60% of individuals using a specific OTC analgesic could not identify the active ingredient (23).

As the use of over the counter medication increases, the incidence of adverse drug reactions will increase. It is highly likely that adverse drug reactions are not reported due to difficulty in identifying the causative medication and distinguishing between disease symptoms and the reaction (42). Research assessing patients' attitudes to OTC medicines has demonstrated concerns with medication efficacy than with potential adverse drug reactions (43). In addition, information included with the OTC product packaging was reviewed only when the medication was initiated or adverse drug events were experienced (44).

Although the use of OTC drugs has increased tremendously, information on perception towards the use of OTC drugs and their potential toxicity is scarce. The high volume of OTC drug use, with high potential to cause side effects, indicates that a detailed examination of OTC usage patterns and health education about self-care is needed. Thus, we will examine the association between participants who read information included with product packaging and their risk perception about OTC drug safety. Thus, the aim of this research is to investigate patient understanding and perception on OTC adverse drug events and the information source. The purpose of this study was to investigate the perception of OTC drug safety and efficacy based on reading information included with the product packaging and the effect of race, education, age and income.

## METHODS

### Sample

The U.S. National Cancer Institute conducts Health Information National Trends (HINTS) to

survey adults on cancer related information (45). HINTS is a biennial, cross sectional survey of a nationally representative sample of American adults that is used to assess the impact of the health information environment. We used HINTS 2012 survey data to examine our research hypotheses. Out of 3,959 adults who completed the survey, we included 2,554 respondents who fitted our research criteria.

### Variable Definitions

Participants were queried if they purchase drugs for themselves or for someone else (yes/no) and how frequently they read the directions and warnings label included with the product packaging (always to never). Risk perception was assessed using two questions with responses recorded as agree, disagree, or no.: *“Do you agree or disagree; OTC drugs are safer than prescription drugs”* and *“Do you agree or disagree; OTC drugs are less effective than prescription drugs”*. Other demographic variables considered were categorised age groups (18- 34 years, 35-49 years, 50-64 years, 65-74 years, 75+ years); educational level (less than high school, high school graduate, some college, bachelor's degree and post baccalaureate); household income (\$0-9,999, \$10,000-14,999, \$15,000-19,999, \$20,-34,999, \$35,000- 49,999, \$50,000- 74,999, \$75,000-99,999, \$100,000- 199,999, \$200,000 or greater) and race and ethnicity (Hispanic, non-Hispanic white, non-Hispanic black and other). All dependent and independent variables are categorical variables. All monetary figures are reported in U.S. dollars.

### Statistical Analysis

Missing data and respondents who did not purchase over-the-counter medications were excluded from the analysis. SPSS Version 20 was used for data and statistical analyses. Descriptive statistics were examined for all variables. A chi-square goodness of fit test was performed to determine the statistical significance of the bivariate relationship for all categorical variables. We conducted Pearson chi-square test to determine if there is any association between dependent and independent variables. To evaluate the association between OTC drug

use and consumer perception of safety and effectiveness, a univariate regression model was applied. Logistic regression analysis was used to examine the role of race, education and income level on the proposed model. A statistical significance level of 0.05 was used to test the statistical significance and 95% confidence intervals were constructed for the estimates.

## RESULTS

The majority of the respondents were female (58.3%), age greater than 50 years (59%), white non-Hispanic (70%) highly educated (75% had more than a college education), married or living with a partner (55%), with an annual household income greater than \$50,000 (50%). Seventy percent of the total respondents agreed that they do purchase OTC drugs for themselves or for others. Fifty-two percent of the respondents reported that the information about the risks of OTC drugs is easy to understand and 66% felt that the risks of OTC drugs help them decide whether to purchase a drug.

Reading directions and warnings on the information included with the product packaging was significantly associated with age ( $p = 0.004$ ), education level ( $p = 0.004$ ), income ( $p = 0.003$ ) and race ( $p < 0.001$ ). There was also a significant association between risk perception about safety of OTC drugs and all demographics except race (age  $p = 0.005$ , income  $p < 0.001$ , education  $< 0.001$ ). Perception on OTC drug effectiveness was also associated with educational level ( $p < 0.001$ ).

OTC drug users who always (OR = 0.36; CI = 0.13-0.98) and never (OR = 0.22; CI: 0.06-0.79) read labels have a higher risk perception than those who read information often or sometimes. There was a significant association among high school graduates and reading OTC product packaging. Those with some high school education had a lower chance of frequently reading information included with OTC drugs (OR= 0.39; CI: 0.20, 0.77) than respondents with some college, bachelor or post-baccalaureate education. Respondents of age less than 50 were always likely to read information included with OTC drugs than respondents 75 years of age and older. Non-Hispanic blacks are more likely to always (OR: 5.24; CI: 2.23, 12.28) or often (OR: 3.03; CI:

1.24, 7.36) read drug information on the OTC drugs than Non-Hispanic whites. OTC drug users in the age group of 18-34 (OR: 0.44; CI: 0.31, 0.65) and 35-49 (OR: 0.66; CI: 0.47, 0.94) are less likely to disagree that OTC drugs are safer than prescription drugs than respondents 75 years and older. OTC drug users who are high school graduates (OR: 0.50; CI: 0.31, 0.81), some college (OR: 0.49; CI: 0.32, 0.74) or bachelor's degree (OR: 60; CI: 0.40, 0.89) are less likely to agree than drug users who have a post-baccalaureate degree that OTC drugs are safer than prescription drugs. Non-Hispanic black (OR: 0.45; CI: 0.24, 0.84) and white (OR: 0.57; CI: 0.34, 0.93) are less likely to consider that OTC drugs are safer than prescription drug than the 'other' race category. Respondents with a lower income (less than \$20,000) (OR: 0.40; CI: 0.17, 0.95) perceived OTCs medications to be less safe than prescription medications than the higher income group (\$200,000 or more). OTC drug users with high school education (OR: 0.51; CI=0.37, 0.72) and some college (OR: 0.58; CI:0.43, 0.78) are less likely to perceive that OTC drugs are more effective than prescription drugs than respondents with a post baccalaureate degree.

See demographic Table 1, Table 2 and Table 3.

## DISCUSSION

We found that education, age, and race influence if drug information included with the OTC product packaging is read. OTC drug users with less than 50 years of age were always likely to read information on the OTC drugs which may be related to literacy and education regarding OTC drugs. The National Literacy survey conducted in 1996 revealed that the highest literacy rate was in persons aged 25-49 years (46-48). Thus, it appears that OTC drug users below 50 years can read and understand labeling on potential adverse events. Hence, they can comprehend and interpret medication risks and can make an informed decision. However, patients with inadequate health literacy may not admit that they have difficulty reading (49-52).

Non-Hispanic blacks are more likely to read drug information on the OTC than Non-Hispanic whites. During medical encounters physicians are giving out more information to

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whites than to blacks and Hispanics (53-57). Also, physicians ask better questions to non-Hispanic white patients compared to Hispanic patients (58, 59). African-American patients

found that physicians are less engaged with them than white patients (60, 61). It appears that due to their experience and lack of information provided by their physicians, non-Hispanic

TABLE 1

READING INFORMATION							
DEMOGRAPHIC			OTC DRUG READ INFORMATION				
VARIABLE		ALWAYS	OFTEN	SOMETIMES	RARELY/ NEVER		
AGE	18-34	388	212 (OR- .29; CI-0.12,0.69)	94 (OR- 0.37; CI-0.15,0.91)	53 (OR- 0.39; CI- 0.15, 1.02)	29	
	35-49	652	375 (OR- 0.42; CI-0.18,0.95)	146 (OR- 0.44; CI-0.18,1.03)	89 (OR- 0.50; CI- 0.20,1.25)	42	
	50-64	912	576 (OR- 0.69; CI-0.30,1.54)	181 (OR- 0.55; CI-0.23,1.28)	112 (OR- 0.64; CI- 0.26,1.57)	43	
	65-74	372	241 (OR- 1.11; CI-0.43,2.83)	81 (OR- 0.95; CI-0.36,2.51)	38 (OR- 0.88; CI-0.31,2.49)	12	
	75 +	230	142	54	26	8	
EDUCATION LEVEL	Less than High school	171	102 (OR- 0.49; CI-0.20,1.17)	34 (OR- 0.47; CI-0.18,1.19)	25 (OR-0.71; CI-0.27,1.89)	10	
	High school graduate	474	320 (OR- 0.74; CI-0.40,1.38)	74 (OR- 0.39; CI-0.20,0.77)	52 (OR- 0.67; CI- 0.33,1.37)	28	
	Some college	777	464 (OR- 0.90; CI-0.51,1.58)	176 (OR- 0.75; CI-0.41,1.34)	97 (OR- 0.97; CI-0.51,1.82)	40	
	Bachelor's degree	663	409 (OR- 1.55; CI-0.88,2.72)	145 (OR- 1.07; CI-0.59,1.93)	80 (OR- 1.25; CI-0.66,2.36)	29	
	Post Baccalaureate degree	469	251	127	64	27	
RACE	Hispanic	230	152 (OR- 3.83; CI-1.60,9.16)	36 (OR- 2.12; CI-0.84,5.34)	36 (OR-3.84; CI-1.52,9.72)	6	
	Non Hispanic Black	360	258 (OR- 5.24; CI- 2.23,12.28)	58 (OR- 3.03; CI-1.24,7.36)	38 (OR- 3.72; CI-1.49,9.26)	6	
	Others	175	116 (OR- 1.14; CI-0.62,2.13)	33 (OR- 0.71; CI-0.36,1.43)	13 (OR- 0.49; CI-0.21,1.12)	13	
	Non Hispanic white	1789	1020	429	231	109	
INCOME LEVEL	\$0 to \$ 9,999	165	111 (OR- 1.55; CI-0.56,4.27)	20 (OR- 0.85; CI-0.27,2.67)	24 (OR-0.84; CI-0.26,2.64)	10	
	\$10,000 to \$ 14,999	161	114 (OR- 2.67; CI-0.86,8.21)	27 (OR- 1.94; CI-0.57,6.52)	14 (OR-0.87; CI-0.24,3.17)	6	
	\$15,000 to \$19,999	155	99 (OR- 1.63; CI-0.57,4.66)	35 (OR- 1.82; CI-0.59,5.62)	13 (OR-0.58; CI-0.17,1.99)	8	
	\$20,000 to \$34,999	404	259 (OR- 1.80; CI-0.75,4.31)	84 (OR- 1.73; CI-0.67,4.47)	40 (OR-0.74; CI-0.27,2.01)	21	
	\$35,000 to \$49,999	382	250 (OR- 2.25; CI-0.92,5.52)	77 (OR- 2.05; CI-0.78,5.39)	40 (OR-1.01; CI-0.37,2.77)	15	
	\$50,000 to \$74,999	461	263 (OR- 2.11; CI-0.89,4.96)	117 (OR- 2.68; CI-1.07,6.71)	63 (OR-1.44; CI-0.55,3.74)	18	
	\$75,000 to \$99,999	316	180 (OR- 1.52; CI-0.65,3.57)	81 (OR- 1.88; CI-0.75,4.71)	38 (OR-0.90; CI-0.34,2.37)	17	
	\$100,000 to \$199,999	385	203 (OR- 1.04; CI-0.47,2.28)	89 (OR- 1.17; CI-0.50,2.74)	64 (OR-0.92; CI-0.38,2.22)	29	
	\$200,000 or more	125	67	26	22	10	



blacks read information on the OTC drug so that they can make an informed decision.

We found that age, education, race, and income affect risk perception about OTC

drugs. OTC drug users with age less than 50 years consider that OTC drugs are safer than prescription drugs. Non-Hispanic blacks and non-Hispanic whites are less likely to consider

TABLE 2

PERCEPTION OF SAFETY				
DEMOGRAPHIC	OTC SAFER THAN PRESCRIPTION DRUGS			
VARIABLE	AGREE	DISAGREE	NO OPINION	
AGE	18- 34	42 (OR-0.74; CI-0.40,1.36)	166 (OR-0.44; CI-0.31,0.65)	180
	35-49	68 (OR-0.79; CI-0.45,1.40)	341 (OR-0.66; CI-0.47,0.94)	243
	50-64	109 (OR-1.01; CI-0.59,1.74)	472 (OR-0.71; CI-0.51,1.00)	331
	65-74	42 (OR-1.01; CI-0.55,1.84)	197 (OR-0.77; CI-0.53,1.11)	133
	75 +	23	137	70
EDUCATION LEVEL	Less than High school	23 (OR-0.83; CI-0.45,1.56)	89 (OR-0.73; CI-0.48,1.12)	59
	High school gradate	46 (OR-0.50; CI-0.31,0.81)	234 (OR-0.61; CI-0.45,0.83)	194
	Some college	72 (OR-0.49; CI-0.32,0.74)	375 (OR-0.61; CI-0.46,0.80)	330
	Bachelor's degree	71 (OR-0.60; CI-0.40,0.89)	350 (OR-0.79; CI-0.60,1.03)	242
	Post Baccalaureate degree	72	265	132
RACE	Hispanic	25 (OR-0.64; CI-0.33,1.25)	125 (OR-1.04; CI-0.66,1.64)	80
	Non Hispanic white	198 (OR-0.57; CI-0.34,0.93)	921 (OR-0.803; CI-0.56,1.15)	670
	Non Hispanic Black	32 (OR-0.45; CI-0.24,0.84)	175 (OR-0.74; CI-0.49,1.12)	153
	Others	29	92	54
INCOME LEVEL	\$0 to \$ 9,999	19 (OR-0.49; CI-0.22,1.07)	75 (OR-0.69; CI-0.39,1.21)	71
	\$10,000 to \$ 14,999	24 (OR-0.89; CI-0.41,1.91)	89 (OR-1.12; CI-0.63,1.99)	48
	\$15,000 to \$19,999	12 (OR-0.40; CI-0.17,0.95)	87 (OR-1.00; CI-0.57,1.76)	56
	\$20,000 to \$34,999	28 (OR-0.32; CI-0.15,0.64)	209 (OR-.81; CI-0.49,1.32)	167
	\$35,000 to \$49,999	45 (OR-0.49; CI-0.25,0.94)	175 (OR-0.65; CI-0.40,1.06)	162
	\$50,000 to \$74,999	51 (OR-0.48; CI-0.26,0.90)	230 (OR-0.76; CI-0.47,1.23)	180
	\$75,000 to \$99,999	34 (OR-0.50; CI-0.26,0.97)	171 (OR-0.90; CI-0.55,1.47)	111
	\$100,000 to \$199,999	45 (OR-0.52; CI-0.28,0.98)	211 (OR-0.90; CI-0.56,1.46)	129
	\$200,000 or more	26	66	33

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OTC drugs safer than prescription drugs. The perception that OTC drugs are safer than prescription drugs could be due to a general belief among people that only OTC medicines

are safe and that OTC medicines do not have serious side effects (44). Although the prevalence of medication use has been reported to vary by race/ethnicity with 84% in whites and

TABLE 3

PERCEPTION OF EFFECTIVENESS				
DEMOGRAPHIC		OTC DRUGS ARE LESS EFFECTIVE THAN PRESCRIPTION DRUGS		
VARIABLE		AGREE	DISAGREE	NO OPINION
AGE	18-34	109 (OR-0.87; CI-0.56,1.34)	148 (OR-0.94; CI-0.63,1.42)	131
	35-49	197 (OR-1.18; CI-0.79,1.76)	275 (OR-1.29; CI-0.88,1.89)	180
	50-64	280 (OR-1.06; CI-0.73,1.55)	352 (OR-1.11; CI-0.77,1.60)	280
	65-74	114 (OR-0.98; CI-0.64,1.49)	134 (OR-0.97; CI-0.65,1.46)	124
	75+	70	85	75
EDUCATION LEVEL	Less than High school	53 (OR-0.98; CI-0.60,1.62)	66 (OR-0.68; CI-0.43,1.09)	52
	High school graduate	151 (OR-0.89; CI-0.62,1.27)	155 (OR-0.51; CI-0.37,0.72)	168
	Some college	246 (OR-0.93; CI-0.67,1.28)	271 (OR-0.58; CI-0.43,0.78)	260
	Bachelor's degree	191 (OR-1.04; CI-0.75,1.44)	287 (OR-0.89; CI-0.66,1.20)	185
	Post Baccalaureate degree	129	215	125
RACE	Hispanic	70 (OR-1.61; CI-0.95,2.75)	92 (OR-1.24; CI-0.77,2.00)	68
	Non Hispanic white	556 (OR-1.59; CI-1.04,2.43)	689 (OR-1.15; CI-0.79,1.66)	544
	Non Hispanic Black	103 (OR-1.37; CI-0.84,2.24)	140 (OR-1.12; CI-0.73,1.74)	117
	Others	41	73	61
INCOME LEVEL	\$0 to \$9,999	55 (OR-0.88; CI-0.47,1.66)	58 (OR-1.14; CI-0.61,2.11)	52
	\$10,000 to \$14,999	41 (OR-0.67; CI-0.35,1.28)	70 (OR-1.45; CI-0.79,2.66)	50
	\$15,000 to \$19,999	48 (OR-0.86; CI-0.45,1.63)	60 (OR-1.37; CI-0.74,2.54)	47
	\$20,000 to \$34,999	132 (OR-0.92; CI-0.53,1.59)	154 (OR-1.37; CI-0.80,2.34)	118
	\$35,000 to \$49,999	111 (OR-0.65; CI-0.38,1.11)	133 (OR-0.93; CI-0.55,1.58)	138
	\$50,000 to \$74,999	139 (OR-0.74; CI-0.44,1.26)	172 (OR-1.05; CI-0.63,1.76)	150
	\$75,000 to \$99,999	86 (OR-0.72; CI-0.42,1.24)	137 (OR-1.24; CI-0.73,2.09)	93
	\$100,000 to \$199,999	114 (OR-0.81; CI-0.48,1.36)	163 (OR-1.17; CI-0.70,1.96)	108
	\$200,000 or more	44	47	34

Native Americans and 76% in blacks (62), our results identified that Non-Hispanic blacks and non-Hispanic whites are less likely to consider OTC drugs safer than prescription drugs. The lower income group perceived OTCs to be less safe than prescription medications. Darn et. al, reported that patients having annual income less than \$20 000 per year are more likely to discuss cost of medicine than patients having annual income more than \$60 000 per year (63). Cost discussions were also less likely to occur with medications prescribed to older patients and by family physicians or internists (63, 64). Since the use of OTC drugs are not generally discussed with physicians (65), people with low income and low education may perceive OTC drugs less safe.

The data for this study is taken from a national dataset (45) with a representative sample of U.S adults. Hence, the data should be considered and interpreted in the context of several strengths and limitations. Strengths of this study includes the large sample size, diverse participant group, random selection of respondents and the demographics of the study sample is representative of the U.S. population. Though rigorous sampling procedures were utilized, there is a chance of recall bias. Finally, this was a secondary data analysis of an existing data and was not specifically designed to address the study question.

Availability of medications OTC that were previously only available with a prescription are beneficial to patients because these medications are available without seeing a provider and obtaining and filling a prescription is not required. However the availability of OTC drugs decreases the probability that patients will receive appropriate education on how to administer the medication (66). In addition, most health insurance plans will not pay or reimburse for OTC drugs. From our results, use of OTC drugs are more common in patients with lower income and some college education. It is possible that lower income respondents may delay seeking medical care and consume over-the-counter drugs prior to seeking care from a provider.

Consumers are exposed to several commercial messages daily delivered in various forms: radio ads, newspaper ads, TV commercials billboard ads, etc. (67). Companies and organizations deploy these communication tools to sell their products. Some groups of

people may be disproportionately exposed to commercial messages (68) and advertising plays a crucial role in OTC purchases (69). Drug advertising needs to be regulated otherwise it may mislead unsuspecting consumers (70). According to the World Health Organization (71), about 66% of the world's countries do not have laws or do not enforce laws to regulated pharmaceutical advertising.

Clearly some OTC users are making decisions about drug treatment based on inaccurate or inappropriate information rather than relying on traditionally acceptable sources of information such as physicians, pharmacists, and drug labels (72). The consequences of inappropriate drug treatment are economic waste from reduced productivity, lost wages, drug and hospital bills and physical discomfort associated with over- or under-treatment (73). As the cost of personal medical care increases, the problems associated with self-care may increase. Teaching consumers about drugs and their appropriate use is complex. The relationship between consumers' knowledge of a product and use of the product is such that it cannot be assumed that increased knowledge of product safety will result in safer use of products (74). Consumer information programs need to be designed so that meaningful results can be incorporated into public policy. Consumer comprehension of the information and the relationship of understanding the information to drug use require further study.

The use of OTC drugs must be done safely. Since there is no prescription required for buying OTC drugs it is become necessary to inform consumers about the benefits and risks of OTC medicines. The need for patient education regarding the safe and effective use of over-the-counter medications is increasing rapidly with the increase in number and availability of OTC drugs. There are several mechanisms developed by different agencies to increase the safe and effective use of OTC medicines (25). OTCs are commonly purchased in community pharmacies and pharmacists can be a valuable resource to consult regarding appropriate OTC use. As drug experts, pharmacists have a wealth of knowledge pertaining to safe and effective drug use. Generally OTC drugs are not purchased after consultation with physicians, it becomes important to educate those people with low reading comprehension levels and English as a second language, about the



product labeling. All OTC medicines should have standardized labels which are easy to understand and capture the attention of the consumers on safety information provided on the labels.

## CONCLUSIONS

OTC drug users lack information and knowledge about the drug. Consumers consume OTC drugs according to their perception of

safety and efficacy. OTC users need to be more informed by providing easily accessible information. Pharmacists, physicians and primary care providers have a responsibility to assist the public in informed decision-making regarding OTC drug use. Advice and care includes discussing risk versus benefit, adverse drug reactions, and drug interactions. Consumers should talk to pharmacists or another healthcare professional to provide the most accurate education pertaining to appropriate and safe OTC drug use.

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