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ABSTRACT

The Direct-to-Consumer Advertising (DTCA) of pharmaceutical firms has been defined as an attempt of pharmaceutical companies to advertise products directly to patients (comsumers). Pharmaceutical DTCA has been criticized due to its inappropriateness and some urged the need to strengthen regulations. The DTCA has an impact on the public from both a benefit and harm concern. The purpose of this study is to investigate the current trend of pharmaceutical DTCA in the US and its effect on patients, physicians, and drug utilization. The methodology used in the research is literature review and semi-structured interview. The pharmaceutical DTCA showed reduction in total spending with the television advertising as the biggest channel of DTCA. The small channel market of advertising was the online approach where three-digit growth of 109% was demonstrated. The DTCA affected the physician-patient relationship as well as patient satisfaction. Patients who received the medication associated with DTCA showed higher satisfaction by 43% compared to those receiving other medications. The under-diagnosed conditions, such as depression, could potentially benefit from pharmaceutical DTCA by increasing the awareness regarding those diseases. The advertising of Tegaserod, a medication for irritable bowel syndrome indicated the increasing awareness of the disease along with increasing numbers of Tegaserod prescriptions. The increase of drug utilization by pharmaceutical DTCA seemed to be beneficial in the treatment of benign prostatic hypertrophy. The advertising of second line drugs resulted in an increase of the first line drug utilization by two times compared to the second line drug utilization. The benefit of pharmaceutical DTCA included enhancing appropriate drug utilization by increasing awareness due to diseases such as benign prostatic hypertrophy. The DTCA might cause potential harm by interfering with a physician's decision regarding prescription drug choice. Additional studies should focus on the type and content of DTCA. The limitation of the study was lack of available data on pharmaceutical DTCA spending to the public.

INTRODUCTION

The Direct-to-Consumer Advertising (DTCA) of pharmaceutical firms has been defined as an attempt of pharmaceutical companies to advertise or promote information regarding a prescription drug directly to patients. The DTCA can be performed through a variety of advertising channels including, television broadcast, billboards, and consumer magazines (Abel et al., 2006).

There have been many types of DTCA, which have included: "help-seeking ads", "reminder ads", and "product claim ads." (Ventola, 2011) The "help-seeking ad" type has been categorized by a presence of only information regarding to disease and omitted the drug information. The "reminder ad." provided limited information regarding prescription medicine, such as the name of drug, pricing, and strength; however, this type of advertisement did not provide the indication or any claim on efficacy or any drug effects (Gellad & Lyles, 2007). The "product claim ad." was the advertisement that involved in more holistic provision of a prescription drug information compared with the other types of advertisement. This type of advertisement provided the indication, efficacy, and safety profile of the prescription drug (Connors, 2009). Even though some countries have allowed limited prescription drug advertisement, the US and New Zealand are the only two countries that have "product claim ad" type widely advertised on television and other broadcasting media (Abel et al., 2006; Vats, 2014).

The broadcast of prescription drugs via television has become more popular since the loosening of Food and Drug Administration (FDA) regulation on DTCA in 1997 (Morgan, 2007). The expenditure of DTCA was higher than $4 billion in 2004 and showed 23% growth compared to the previous year (Gellad & Lyles, 2007). Even though the total spending of prescription drugs promotion had declined between 2006 and 2010, DTCA had been criticized

continuously due to appropriateness and legal issues. For example, DTCA generally associated with black box warning of prescription drugs that may cause serious side effect (Arnold & Oakley, 2013). The purpose of DTCA mainly focused on the commercial oriented patient rather than intended to educate patient. The DTCA has generally targeted at a limited range of drugs. In 2000, 20 of the top products in pharmaceutical industry accounted for 60% of total spending in DTCA. Furthermore, the advertisement of a single medication, Vioxx cost $161 million in 2000, which surpassed many of advertisement expenses for consumer products such as Dell computers, Budweiser, Pepsi, and Nike (Rosenthal, Berndt, Donohue, Frank, & Epstein, 2002). After the discovery of serious side effects of Vioxx, including stroke and myocardial infarction, it has been withdrawn from the market since September 2004 (Schuchman, 2007).

Many critics have addressed that DTCA has been under-regulated and urged the need to strengthen rules and regulations (Donahue, Cervasco, & Rosenthal, 2007). For example, the advertisement of prescription drugs required no approval or any pre-clearance before the time of broadcasting. In the case where any violations of FDA regulation occurred, the FDA could request for revisions of the advertisement; however, it would not change the fact that consumers may already had exposure to inappropriate advertisement and might be misled by those information (Shaw, 2008). The guidance for DTCA established by the FDA has also been seen as unclear. For instance, the guidance regulated the pharmaceutical company to include only "the most serious and the most common" for their products has allowed the pharmaceutical companies to decide which associated risk(s) to be disclosed in their advertisement (Biegler & Vargas, 2013). Furthermore, the establishment of DTCA guidance has generally been delayed for many years. The draft of the new guidance regarding risk communication was created as a draft version since 2004 but was never been revised until 2015 (Christopher & Robertson, 2015).

The DTCA impacts the public in both favorable and harmful ways (Almasi, Stafford, Kravitz, & Mansfield, 2006). The benefits of DTCA for the public have included: more empowered patients, enhancement of the patient-physician relationship, and made awareness more apparent to the patients, especially for underdiagnoses conditions (Delbaere & Smith, 2006). On the other hand, the opposing position claimed that DTCA led to many drawbacks, which have included: misled patients regarding drug information, interference with physician decision in prescribing, and drug overutilization (Ventola, 2011).

Per the Centers for Medicare & Medicaid Service (CMS), prescription drugs costs have risen to $297.7 billion in 2014, with 12.2% growth rate compared to 2013 (CMS, 2014). The rising health care expenditure has been one of the most problematic issues in the U.S. health care environment. The growing trend of DTCA could worsen the situation of cost containment especially for prescription drug cost (Donahue et al, 2007).

The purpose of this research was to observe the current practice of DTCA in the US and observed the effect of DTCA by pharmaceutical firm, especially on patients, physicians, and drug utilization.

METHODOLOGY

The hypothesis of the research was that DTCA may be one of the reasons that drive health care cost in the U.S. by provoking inappropriate drug utilization. The methodology for this research is literature review and semi-structured interview. A systematic literature review was performed as following: (1) identify relevant database and key words, and accessing the primary search results and the appropriateness of key words and literatures; (2) established inclusion criteria and selected the literature based on these criteria; (3) categorization of the literature review results.

Step 1: Literature Search and Collection

Four of electronic databases were used for literature review: Marshall University Ebscohost database, ScienceDirect, Pubmed, and Google Scholar. Keywords included: direct-to-consumer advertising and expenditure/spending, DTCA and expenditure or spending, prescription drug advertising, DTCA and drug utilization, DTCA and effect, and prescription drug and spending.

Step 2: Literature Analysis and Inclusion Criteria

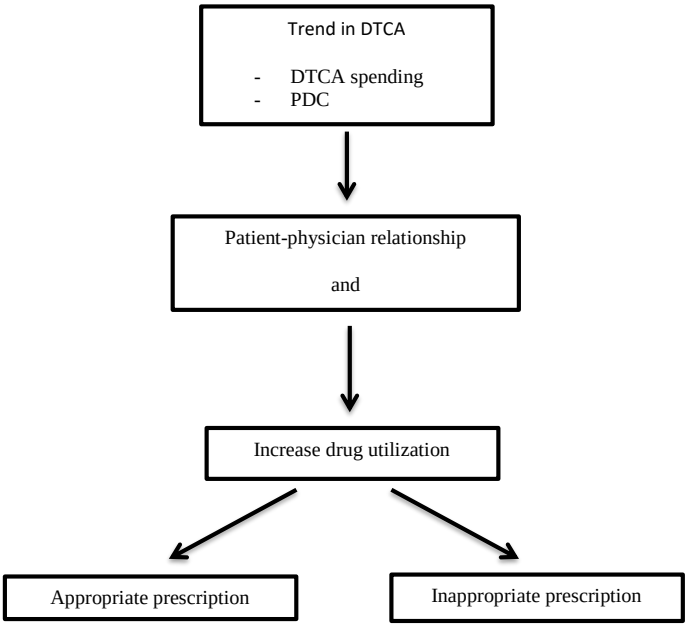
The inclusion criteria were literature written in English, research study that conducted in the North America or New Zealand, and published year from 2000 to 2016. The literature published from 2006 or later was more favorable since provided a more recent trend in DTCA promotion over the past ten years. A total of 87 articles were found and 39 of those have been included in this review.

Step 3: Literature Categorization

The selected literatures were categorized based on conceptual framework and based on the subheadings, which included: The Emerging of Online DTCA and Trend for Pharmaceutical Advertising; Prescription Drug Coupons, a new form of DTCA; DTCA Effect Relationship between Patient and Physician and Patient's Satisfaction; and The DTCA and Drug Utilization.

A semi-structure structured interview was performed via e-mail. The interviewee is a physician that has engaged in prescribing medication for longer than 20 years in the U.S. The answer has been reviewed by the researcher and excluded any unrelated information.

Figure1: Conceptual framework



RESULTS

The Emerging of Online DTCA and Trend for Pharmaceutical Advertising

With the growing of internet-based information, consumers have started to actively search for information through online channel including for medical information. The expenditure of internet-based pharmaceutical advertising or eDTCA has been expected to gain double-digit growth between 2010-2015 (Liang & Mackey, 2011). The advantage of eDTCA was the ability to spread the advertisement globally via multiple channels such as website, satellite TV, and social media (Mintzes, Morgan, & Wright, 2009).

Mackey, Cuomo, and Liang (2015) conducted a research study to investigate the information regarding to DTCA expense by pharmaceutical firms from 2005 to 2009. The data were collected from multiple marketing data firms such as IMS health, Nielsen Co., Cegedim Strategic Data, and Kantar Media. The data was analyzed for total spending of DTCA and spending for each DTCA sub-category, which included television, print media, radio, outdoor ads, and internet (eDTCA). The total spending of DTCA by pharmaceutical firms decreased from $4.8 billion in 2005 to $4.4 billion in 2009 and showed 7.83% declined during 2005 to 2009. The biggest spending of DTCA sub-category in this period was television with approximately $2.9 billion in 2009 however, this channel showed decrease in spending with 13.20% from 2005 to 2009. Even though eDTCA sub-category accounted for small amount of spending in total DTCA but experienced three-digit growth at 109 % in the same period. (Mackey et al., 2015).

DTCA category	2005 expenditure	2009 expenditure	Change (%)
Television	$3,390,587,472	$2,943,000,894	-13.20
Print media + radio + outdoor ads	$1,396,225,125	$1,403,438,560	0.52
Internet	$56,180,283	$117,403,346	108.98
Total DTCA	$4,842,992,880	$4,463,842,800	-7.83

Table1: DTCA expenditure in 2005 and in 2009 (Kornfield et al., 2015)

Kornfield et al. (2015) reported a significant decrease in household exposure to DTCA via television from 2007 to 2013. The average of televised DTCA household exposure was 195.3 times per month in 2007 compared with 111.1 times per month in 2011, indicated 43% reduction from 2007 to 2013. However, the household exposure of DTCA for depression medication increased from 8.6 times per month in 2007 to 11.3 times per month in 2011 (Kornfield et al., 2015). The reduction in televised DTCA might result from the emerging of online media advertisement (Liang & Mackey, 2011).

The overall cost of pharmaceutical promotion spending reached its peak of $36.1 billion in 2004 and has declined gradually from 2005 to $27.7 billion in 2010. The cost of DTCA promotion has had a similar trend but reached its peak of $5.9 billion in 2006 and followed by declining to $4.4 billion in 2010. The electronic promotion was the only promotional category that has been described by growth in expense despite of small amount of portion in overall promotional cost (Kornfield, Donohue, Berndt, & Alexander, 2013).

Prescription Drug Coupons, a New Form of DTCA

The Prescription Drug Coupons (PDC) was a novel form of pharmaceutical marketing that offered special discounts for branded drugs to patients who had private insurance or the patients who paid out-of-pocket (Gagnon & Lexchin, 2008). The ideal goal of PDC was to alleviate the burden of cost regarding too expensive branded drug that might result in non-adherence and further complications. The PDC could be gained through variety of media such as pamphlets in physician office, website, and eCoupons (Grande, 2012).

The PDC generally has been associated with the promotion of expensive branded drugs. The result of searching by using key words “prescription drug coupon” with Google showed an outcome of 9 products from top-10 selling drug during November 2011 to November 2012. Six out of ten founded products also labeled with black box warnings that related to potential for serious complications (Grande, 2012). Furthermore, the question was raised whether PDC would lead to lower prescription drug expenditures or appropriate use of medication in a long run or not (Gagnon & Lexchin, 2008). For example, Lipitor was one of the products engaged in PDC that offered the high discount at $75 per month in 2014 and would result in $1119.6 cost per year in 2014. However, Lipitor could be replace by generic product with a total cost of $192 per year in 2014 and provided substantial saving of $927.60 per year in 2014 compared with the cost of Lipitor (Mackey, Yagi, & Liang, 2014). Bhutada, Cook, and Perri (2009) found that patients who exposed to PDC advertising were more likely to ask physicians for specific prescription drugs and showed more favorable attitude toward those products.

DTCA Effect Relationship between Patient and Physician and Patient's Satisfaction

The unique marketing promotion of DTCA had altered the way patient and physician interacted with each other in the US health care system (Potter & McKinlay, 2005). The DTCA exposure has increased patient's demand for specific prescription by increase the chance patients would ask their physician regarding to those drugs. Additionally, these authors also showed that 43% of patient, who mentioned DTCA drugs during last physician office visit, received medication they requested (Weissman et al., 2004).

The effect of DTCA on patient satisfaction might vary due to age and severity of conditions (Blose & Mack, 2009). A study conducted by using vignettes indicated that denial of patient's request for specific prescription affected patient satisfaction, trust, and commitment; however, the expectation of receiving prescription did not affect those factors. (Shah, Bentley, & McCaffrey, 2006).

Lewin (2013) studied the factor that affected patient satisfaction in patient groups who discussed information from DTCA with their physicians. The data were collected via random-digit telephone interview. The result showed that receiving diagnosis was not associated with increase patient's satisfaction but receiving prescription was associated with higher patient's satisfaction. Furthermore, patients who received prescription related to DTCA were more likely to report higher satisfaction by 42.2% compared with those who received other prescription. Finally, patients who did not receive prescription related to DTCA was more likely to have higher satisfaction if there were acknowledged by some kind of explanations regarding to the denial (Lewin, 2013).

The DTCA and Drug Utilization

The DTCA has encouraged patient to seek for treatment with physicians especially for under-diagnosed condition and condition associated with social stigma such as depression (Holmer, 2002). On the contrary, the DTCA has led to over diagnosis and drug over utilization that might ultimately result in increase of adverse drug reaction (Ross, & Kravitz, 2013). Eventually, there has been no sufficient evidence to identify whether the DTCA would cause more harm than benefit, vice versa (Mintzes, 2012; Law, Majumdar, & Soumerai, 2008).

Irritable bowel syndrome (IBS) was a chronic condition affected roughly 10% of the US population; however, only small number of patients sought for treatment because of many reasons such as low public awareness, social stigma, and absence of effective solution (Cremonini & Talley, 2005). Tegaserod was an effective medication for IBS that was heavily marketed during 2005 to 2007 and was suspended from the market since March 2007 due to its significant risk of heart conditions (US FDA, 2008). The DTCA of tegaserod increased the awareness of IBS, increased the physician visits, and increased number of prescription for tegaserod (Dorn, Farley, Hansen, Shah, & Sandler, 2009).

The effect of DTCA that increased the number of prescription could be seen in many product classes included statins, H2 receptor antagonists, and triptans. The beneficial outcome of the DTCA on increase prescription has been ambiguous and might be difficult to evaluate. In other word, if the increase in prescription has resulted from more awareness and using of first line medication, the DTCA would be consider beneficial; conversely, it would be detrimental if the DTCA promoted inappropriate use of second line medication (Skeldon, Kozhimannil, Majumdar, & Law, 2015).

Tamsulosin (Flomax) and dutasteride (Adovart) were first line and second line medications for benign prostatic hypertrophy respectively. Skeldon et al. (2015) investigated the expenditure of DTCA, web search interest, and drug utilization for both drug from January 2003 to December 2007. The DTCA spending for tamsulosin was $139 million for the period of 2003 to 2007 and for dutasteride was $231 million from 2003 to 2007. The effect of both campaigns tamsulosin and dutasteride resulted in aggregate increase of both product awareness, which detected by web search interest, and drug utilization. For example, the DTCA of dutasteride (second line medication) not only increased the utilization trend of dutasteride but also increased the utilization of tamsulosin (first line medication) nearly two times compared to dutasteride. Thus, the DTCA of competing products was likely to show beneficial outcome of increase appropriate prescription by increase in awareness rather than inappropriate use of second line medication (Skeldon et al., 2015)

DISCUSSION

The practice of DTCA in the U.S. has been criticized by those who both supported and opposed DTCA. However, it is highly unlikely that DTCA will fade away in pharmaceutical advertising practice in the US. The result from Mackey et al. (2015) has showed slight decrease in overall spending of DTCA of 7.83 % during 2005 to 2009, but this decrease was likely to have been caused by shifting from one type of DTCA to another less expensive form of DTCA. The television channel served as the most important channel of DTCA since it consisted of approximately 65% of total spending with $2.9 billion in 2009. The television sub-category experienced a decrease of 13.20% during 2005 to 2009, while the internet sub-category demonstrated an increase by 108.98% in the same period. It was possible that the effort of pharmaceutical company to advertise its product directly to a patient remained the same or even higher but shifting to online channel with less costs and more effectiveness. Liang and Mackey (2011) also reported the internet was the most popular source among consumers who are searching for health-related information.

The PDC was another trend that emerged in DTCA in the U.S. that might cause detrimental effects to patients since it is involved with black box warning for prescription drugs. Even though the pharmaceutical company claimed that PDC aimed to promote accessibility and adherence to medication but it was more likely for extending product life cycle since the majority of prescription drugs available with PDC were patent expired or close to patent expiration date. If the trend of PDC became more popular it might increase the cost of prescription drug by promoting more expensive drugs, especially brand name that could be substituted with lower cost generic drugs regardless of discounting.

The DTCA seemed to affect the way a patient and physician interacted to each other. The DTCA increased demand for specific drugs and patients have been engaged in mentioning specific medications to their physicians. Furthermore, those who received the medication they mentioned to their physician showed greater satisfaction than others who did not (Lewin, 2013; Weissman et al., 2004). This situation could put a pressure on the physician who wished to satisfy their patient and lead into inappropriate prescribing and thus, result in increased unsuitable drug utilization. A survey of physicians also reported that DTCA resulted in increased some of the inappropriate prescription volume and affected the prescribing pattern (Robinson et al., 2004).

The DTCA could increase the drug utilization by increase the awareness of a patient regarding to disease especially a condition that associated with social stigma. However, this increase of drug utilization had both beneficial and harmful consequences. Tegarserod prescription prescribing increased by the effect of DTCA and has been withdrawn from the market since 2007 due to significant risk of heart conditions. This similar issue was also found earlier with the Vioxx in 2004. There was no strict regulation for DTCA on the new drugs that full safety profile has not been established (Liang & Mackey, 2011).

On the other hand, the beneficial effect on DTCA has been seen in the case of tamsulosin and dutasteride. The promotion of dutasteride, which was the second line therapy of benign prostatic hyperplasia, resulted in increased awareness of the condition and the increase in prescription volume of tamsulosin, which is the first line therapy. Thus, the promotion of dutasteride through DTCA could be seen as beneficial by increasing diagnosis and increase appropriate drug utilization.

Todd W. Gress, MD, an associate professor for internal medicine at School of Medicine, Marshall University. As an interviewee in this study, he shared some concern regarding DTCA by pharmaceutical firms in the US. He stated that the DTCA could have a significant impact on the health care system since it enhances awareness to the public of devices or therapies that were generally very expensive and may not be the standard of care for specific disease processes. He also recalled one patient that requested a new oral anticoagulant based on DTCA. This situation led to more consumption in time at the office visit because of the physician needing to justify that this medication may not suitable for this patient. Dr. Gress also believed that exposure to DTCA encouraged conversations between patients and physicians, yet could push the physicians against their better judgment and prescribed the new medication. The DTCA might cause potential harm; primarily by diminishing the time involved in discussion the DTCA information brought by the patient to the visit. The DTCA regarding only one option of treatment was a very biased narrow approach to begin with and its primary intent was more likely as financial gain for the pharmaceutical company.

The trend of DTCA continues growing and resulting in increased drug utilization through multiple mechanisms, which included increase demand of the patient for specific drug, increase awareness regarding to under-diagnosed condition, and promoting dialogue between physician and patient. The content for each DTCA might affect the different outcomes regarding the appropriateness of drug utilization.

Future studies should focus on the type and content of DTCA and the proper use of prescription drugs. Furthermore, retrospective study can be performed to investigate the correlation between DTCA spending and health care expenditure among different countries. The limitation of this study included limited current information of DTCA spending from the pharmaceutical company that available to the public. There was lack of the quantitative data on the effect of pharmaceutical DTCA, thus making it difficult to evaluate the actual effect of DTCA on drug utilization. Additionally, DTCA is a very subjective topic which is based on individual opinion. It can affect research bias and bias from the interviewee.

CONCLUSION

The online channel was a critical advertising portal for DTCA by pharmaceutical firms. The DTCA of pharmaceutical company indicated mixed results of potential benefit and harm. For example, the DTCA by pharmaceutical firm enhanced the awareness of patient to under-diagnosed condition such as benign prostatic hypertrophy; however, it could increase the prescription drug cost by promoting expensive branded drugs.

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