# An empirical research of willingness to purchase generic prescription medicines

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## Abstract

This study investigates consumer perception on generic prescription medicines (GPM) in Australia. Specifically, it examines how consumer concern and consumer knowledge about counterfeit medicines influence attitudes towards generic prescription medicine and willingness to pay more for branded prescription medicines. Data were collected using mail surveys and 281 usable responses were analyzed by using SPSS and AMOS to test the hypotheses and model fit. The consumer concern was found to be a significant predictor of attitude and willingness to pay more for branded prescription medicines but consumer knowledge is an insignificant predictor. Implications of the study and the corresponding recommendations are presented and discussed.

Keywords: prescription medicines, generic medicines, generic prescription medicines, Theory of Reasoned Behaviour (TRA), counterfeit medicines.

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## Introduction

Counterfeit medicines are becoming increasingly prevalent in the global market since the last decade (Liang, 2006; Lybecker, 2007). Although there is a small probability of counterfeit medicines in developed countries, Australia is not safe or excluded from illegal entries of such medicines (World Health Organization, 2008). The World Health Organization (WHO) estimates that up to 60% of drugs in some developing countries and up to 20% in some developed countries are counterfeits (Liang, 2006; WHO, 2010). According to WHO facts (2010), more than 50% of medicines that purchased from Internet are counterfeit. While there are many studies done in this area (e.g. Moken, 2003; Liang, 2006; Lybecker, 2007), there is a dearth of research from the consumers perspective (Bian and Veloutsou, 2007; Staake, Thiesse, and Fleisch, 2009; Veloutsou and Bian, 2008).

Moken (2003) conducted a study in China and found two overarching issues with respect to counterfeit medicines (Lybecker, 2008; Wyld, 2008). Firstly, consumers "unknowingly" purchase deceptive counterfeit medicines (Bloch et al., 1993; Liang, 2006). These can be defined as medicines sold under a pharmaceutical company brand / label, usually at a much lower price. These medicines may (a) contain a lesser amount of the real medicine's active ingredient (b) contain no active ingredient at all (c) compose of substances varying from talcum power to aspirin or poison (d) blatantly mimic the real medicines, inclusive of the manufacturer's labels, pamphlets, and purity seals but are in fact fakes (Moken, 2003). Secondly, consumers are confused if "generic brands" of medicines are in fact counterfeits (d'Astous and Gargouri, 2001; Lybecker, 2008) because generic medicine is defined as medicine that possesses the same active medicinal substances as original medicines and sold at a cheaper price than original medicines. In addition, generic medicines also have identical labelling from the genuine drugs and have to pass a preapproval good manufacturing process (GMP) inspection (Lybecker, 2008). Therefore, it is observed that the growing consumer concern and the lack of consumer knowledge about counterfeit medicines have led to less than favorable attitudes towards generic medicines (Bang et al., 2000; Liang, 2006; Marcketti and Shelley, 2009). In the context of this study, consumers in Australia will also share the same issues with respect to counterfeit medicines.

This study will focus only on generic prescription medicines excluding over-the-counter (OTC) medicines. It is estimated that around 30% of Pharmaceutical Benefits Scheme (PBS) prescription medicines are dispensed with a generic, representing between 10% and 15% of the value of PBS sales (Löfgren, 2009; Nicholson, 2008; Pharmaceutical Society of Australia, 2006). Around 20% of all generics available in Australian community pharmacies are estimated to be in this category, which includes re-packaged versions of major products such as Ventolin, Losec, Valium, Normison, Augmentin, and Prozac (Löfgren, 2009). In addition, the use of generic medicines could offer substantial savings on healthcare with reduced costs up to 50 percent on pharmaceutical expenditures. (McCarthy, 2010). Therefore, the Australian government has encouraged all hospitals to use generic medicines as it will save cost around AUD$2.5 billion for next five years (McCarthy, 2010). All generic prescription medicines that listed in PBS will be funded by the Australian government.

## Literature Review and Hypotheses Development

Existing literature revealed that most research in generic medicines have been studied from the perspective of practitioners or pharmacists (Hassali, Kong, and Stewart, 2006; Chua, Hassali, Shafie, and Awaisu, 2010). Little research has examined generic medicines from a

consumers' perspective. Specifically, there are no studies on consumer perspective towards generic medicines in Australia. It is extremely important to address consumer concerns regarding the issues and negative publicity surrounding counterfeit medicine.. Hence, there is a dire need to first investigate and understand consumer concern and consumer knowledge towards counterfeit medicines. Furthermore, it will shed further insights into the consumer confusion between generic medicines and counterfeit medicines. In addition, most of the consumer perception studies about generic medicines are conducted using qualitative approaches (Sharrad and Hassali, 2010; Chua, Hassali, Shafie, and Awaisu 2010). Therefore, this empirical study will analyze consumer perception by developing a research model to explain the relevant causal relationships that are postulated in the research model (refer to Figure 1).

**Consumer concern -** When consumers believe that there is a certain problem and they are concerned, they are more likely to adopt consumer behaviour practices to assuage or solve the problem (Hines et al., 1986; Marcketti and Shelley, 2009). It was found that the greater the knowledge and concern about issues within the industry, it was related to greater support for more socially responsible businesses (Dickson, 2000). Consumer concern in the counterfeiting context examines consumer concerns regarding labelling, the legitimateness of the supplier, the source of drug production, the country of origin, contamination of drugs, cost, penalties of being caught possessing counterfeit drugs, health risks, drug policy and regulations and effects of purchasing counterfeit prescription medicines (Moken, 2003; Liang, 2006). Therefore, it can be proposed that;

***H1a****: Consumer concern about counterfeit medicine has a positive influence on the attitude towards generic prescription medicine.*

***H1b****: Consumer concern about counterfeit medicine has a positive influence on the willingness to pay more for trade name (branded) prescription medicines.*

**Consumer Knowledge -** The term is the cognitive representation of product-related experience in a consumer's memory, which takes the form of a product schema and is likely to contain knowledge in the form of coded representations of brands, product attributes, usage situations, general product class information, and evaluation and choice rules (Maheswaran, 1994; Marcketti and Shelley, 2009). Farhar (1996) states that consumer perceptions and preferences about the environment are influenced by both factual and faulty information. If consumers are more knowledgeable, they will have information that would better assist them in making their decisions. More knowledgeable consumers are also more willing to pay a higher price (Bang et al., 2000). In the context of TRA (Ajzen and Fishbein, 1980), it makes sense that heightened knowledge about counterfeit medicine would lead to stronger beliefs about the positive consequence or benefits of generic prescription medicine.

***H2a****: There is a positive relationship between consumer knowledge about counterfeit medicines and attitude towards generic prescription medicines.*

***H2b****: There is a positive relationship between consumer knowledge about counterfeit medicines and willingness to pay more for trade name (branded) prescription medicines.*

**Attitudes towards generic prescription medicines (GPM) -** Attitude towards the behaviour is stronger than attitudes towards an object as it will result in higher likelihood of purchasing. Attitudes are beliefs and perceptions of consumers. Some of the common beliefs and concerns about GPM are the quality and functionality aspects, the social consequences, and the legality of generic prescription medicines. The TRA proposes that attitudes towards a behavior are

influenced by beliefs that the behavior leads to significant consequences (Fishbein and Ajzen, 1975). In this context of study, consumers with strong concern of positive consequence to not purchase counterfeit medicines were significantly more likely to indicate they would be willing to pay more to purchase trade name (branded) medicines (Bang et al., 2000).

***H3**: There is a positive relationship between attitudes towards generic prescription medicines and willingness to pay more for trade name (branded) prescription medicines.*

**Willingness to pay more for branded prescription medicines -** The more that the consumer knows about the advantages of branded prescription medicines, they are more likely to pay more for it (Bang et al., 2000). The willingness to pay more is a relevant measure and reflects the attitude towards the behaviour of consuming generic prescription medicines. If consumers have stronger beliefs about the positive consequences of purchasing genuine prescription medicines, they will have a higher willingness to pay more for the genuine prescription medicines. Higher willingness to pay more for genuine prescription medicines will also lead to higher likelihood to not purchase generic prescription medicines from a legitimate drug store or from the Internet.

***H4a**: Willingness to pay more for trade name prescription medicines has a positive influence to the likelihood to not purchase generic prescription medicines from a legitimate drug store.*

***H4b**: Willingness to pay more for trade name (branded) prescription medicines has a positive influence to the likelihood to not purchase generic prescription medicines from the Internet.*

**Consumer trust in internet shopping -** Trust can be defined as a set of specific relationship intention dealing primarily with integrity, benevolence, competence, and predictability of an Internet online retailer (Gefen, Karahanna, and Straub, 2003). Previous studies have shown that consumer generally will avoid shopping online if the online retailers cannot be trusted (Gefen, 2000; Jarvenpaa and Tractinsky, 1999). There is no study about consumer trust to purchase GPM in internet shopping that moderate willingness to pay more for trade name (branded) prescription medicines and the likelihood to not purchase generic prescription medicines from the Internet.

***H5**: Consumer trusts in internet shopping is a moderation variable between willingness to pay more for purchase genuine prescription medicines and the likelihood for a consumer not to purchase generic prescription medicines from the Internet.*

## Methodology

A mail survey through systematic sampling from the white pages was used to capture the targeted sample population of consumers in Australia nationwide who consume or purchase generic prescription medicines, hence achieving ecological validity (Cowan, 1989; Hornik and Ellis, 1988). The survey form consists of a number of sections comprising establishing scales on consumer concern, consumer knowledge, attitude towards GPM, willingness to pay more for branded prescription medicine, consumer trust in internet shopping, and likelihood to purchase branded prescription medicines from legitimate or drug store (from Marcketti and Shelley, 2009; Wang et al., 2005; Cheung and Lee, 2001). All items were measured on a seven-point Likert scale. 281 usable responses (12.8% response rate) were used in the analysis. The sample consisted of slightly more males (51.2%) than females. The majority of respondents were aged 46 and above (68.3%) and 71.5 percent of respondents are medicine users. There is no significant different between medicine users and non medicine users by using t-test paired samples.

## Result and Analysis

An exploratory factor analysis was conducted on all variables in the study and it shows that there is no overlapping among all variables except attitude towards GPM. Therefore, factor analysis was conducted again on the original 8-items "Attitudes towards generic prescription medicines" scale to found out the 2 dimension factors. Two factors emerged from Varimax rotation and were named "social consequence" and "subjective judgement". For subsequent SEM analysis to be valid, the measurement model (CFA) must be estimated first. The results of CFA estimation has shown that all items are loaded significantly (P<0.001) on each factor. All direct effect estimates are positive. Most squared multiple correlations are at least 0.30. These measurement model results establish divergent validity of the underlying constructs and establish an essential pre-condition for the validity of subsequent structural model estimation. Structural Equation Modelling (SEM) was conducted to test the model fit for the research model. After some adjustments to the model, the model (Figure 1) can be considered as good model fit ($\chi^2$ (57) = 123.346, $p$ = .000, CMIN/df= 2.164), other indicators such as RMSEA = .064, GFI = .938, AGFI = .901, TLI = .966 and CFI = .975 are within the recommended fit level. From SEM result, hypothesis 1b and 4a are accepted. Conversely, hypothesis 1a, 2a, 2b, 3, 4b, and 5 are rejected.

Multi group analysis (moderation test) was conducted to test the difference between two groups ("under 56" (N=148) vs "56 and above"(N=133)) in the model. The general model for moderation test is a good fit ($\chi^2$ = 184.6, df = 92, p = .000, RMSEA = 0.060, GFI = 0.903, TLI = 0.951, CFI = 0.966). The constrained model with all the three regression weights restricted as being equal across the two groups also seemed to provide a good fit to the data ($\chi^2$ = 277.898, df = 97, p = .000, RMSEA = 0.076, TLI = 0.910, and CFI = 0.934 are in recommended level of fit (Hu and Bentler, 1999)). The $\Delta\chi^2$ is 93.3 which is significantly higher than critical value at .05 level (Critical value = 11.07). Therefore, age group ("Under 56" vs "56 and above") is a significant moderator. The results show there is no significant moderating effect of "under 56" vs "56 and above" on the link between concern and attitude, attitude and willingness, and concern and willingness. Hence, "under 56" vs "56 and above" does not appear to moderate those relationship between concern, attitude and attitude and willingness, and concern and willingness.

## Discussion and Implication

The results show that consumer concern about counterfeit medicines has a negative influence with attitude towards GPM but a positive influence with willingness to pay more for branded prescription medicines. The result from hypothesis 1b provides theoretical confirmation in relation to the TRA and further supports and reflects the empirical work of Marcketti and Shelley (2009) but hypothesis 2b shows different result from Marcketti and Shelley (2009) findings. Therefore, marketing and business practitioners can reduce consumer concern by implementing education programs (i.e. education campaign or online learning service) to educate consumers regarding the difference between generic medicines and counterfeit medicines. The policy makers will also need to ensure that the regulatory system for prescription medicines especially generic medicines can be trusted for safety reason and maintain the quality standard.

Furthermore, findings also indicate that attitude towards GPM has negative influence with willingness to pay more for branded prescription medicines. This finding is different with Marcketti and Shelley (2009) findings. Therefore, generic medicine industry should maintain their good image when consumers have trust to purchase their generic products. In addition,

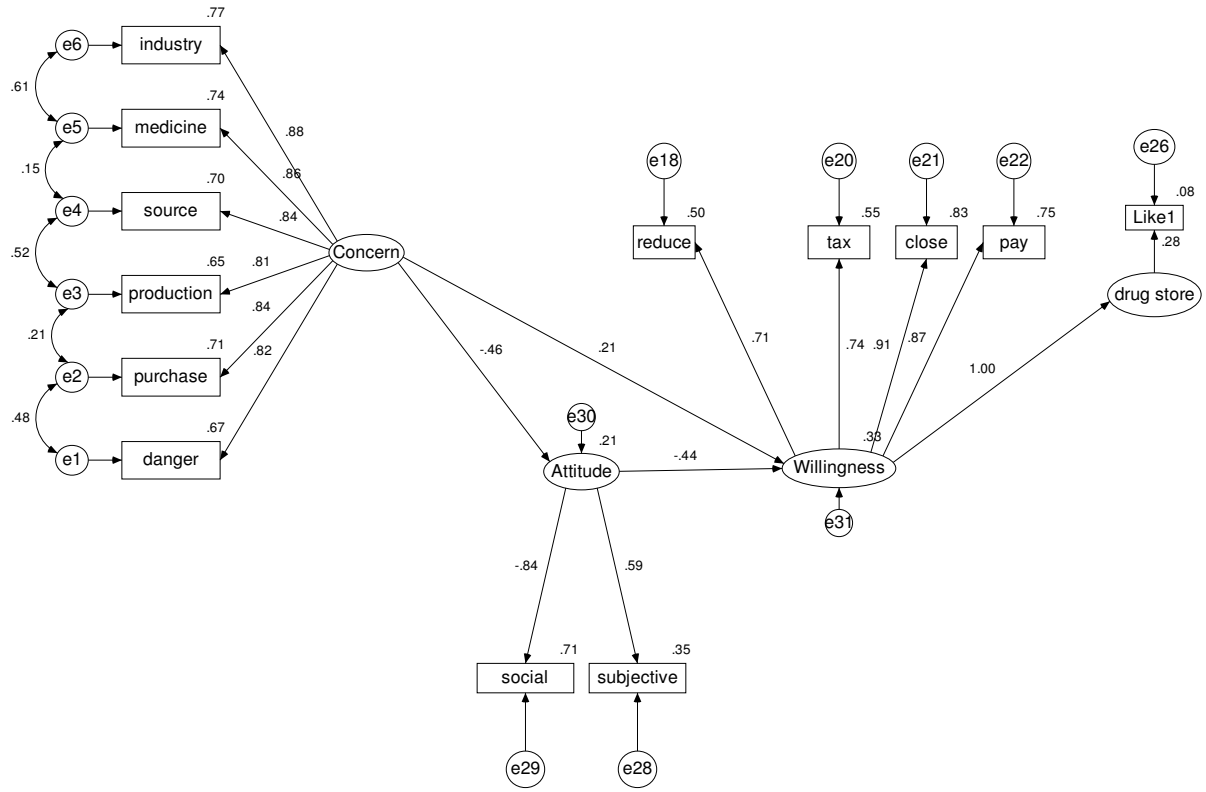
they also need to increase the awareness of generic products to new target consumers by using education advertising through media.

Another finding shows that the willingness to pay more for trade name (branded) prescription medicines has a positive influence to the likelihood to not purchase generic prescription medicines from a legitimate drug store. It shows that consumers prefer to buy their branded prescription medicines in legitimate drug store because consumers can interact with the pharmacists to ensure the originality of the product and the safety for consuming the products. Consumers are also able to view the actual products in the legitimate drug store thus assuring their safety concerns to purchase in store as opposed from an online environment whereby such conditions will not be available. Therefore, government and business practitioners should consider selling generic and branded medicines in legitimate drug stores as this approach will reinforce consumer safety and security in their purchase choices.

## Concluding Comments

It was found that consumer concern is a strong predictor of attitude towards GPM and willingness to pay more for branded prescription medicines. Other future directions can include a cross cultural comparison between a developed and developing country as to whether there are varying levels of knowledge and concern about counterfeit medicines. The sample size for this study can also be extended to different demographic groups.

**Figure 1: Final SEM Model**



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