Cognitive Factors Related in Self-Medication among College Students Based on Prototype/Willingness Model

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Abstract: Self-medication may result in several consequences such as pathogenicity or even mortality. The present study aimed to prediction cognitive factors related in self-medication among college students based on prototype/willingness model. It was crosses sectional study investigating 237 students of Department of Health Education, School of Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran during 2015. A structured questionnaire was applied for collecting data and data were analyzed by SPSS Version 21 using chi-square, t-test, bivariate correlations and regression at 95% significant level. The mean age of respondents was 21.9 years [SD: 2.41], ranged from 18-30 years. Almost 45.1% of the participants had self-medication. There was a significant correlation between health insurance and self-medication (p = 0.004). In addition, it was a significant correlation between smoking and self-medication (p = 0.003). However, there was no significant difference between self-medication and gender, school of study, educational level, marital status and living in dormitory. Attitude, subjective norms and prototype variables were statistically significant for predicting self-medication which they were accounted for 41% of the variation in self-medication behavior intention and 15% of the variation in behavior willingness to self-medication. The findings showed that the attitude, subjective norms and intention were more powerful predictors of self-medication. It seems essential to consider these factors to planning interventions to get better results.

Key words: Self-medication, prototype/willingness model, students, pewerful, Iran

INTRODUCTION

Progresses in pharmacology lead to the production of various medicines which are available to most people. If taking medicines is not supervised, it may result in abusive drug consumption (Tavakoolei, 2001). People only see the safety and healing aspects of medicines; however, pharmacology considers medicine as a blade to heal or endanger people which later could result from lack of proper use (Moghaddam, 2007). Self-medication is known as a global issue which is developing around the world (Davatei *et al.*, 2008). Self-medication may result in

several consequences such as pathogenicity or even mortality. In addition, reports showed that self-medication led to improper patterns for drug abuse (Maldonado *et al.*, 2007). Studies suggested self-medication as a cultural problem (Doostar and Sobhani, 2002). Iran has been known as one of the biggest medicine users so that during the last decade taking medicine significantly increased. Studies showed that there is no proper pattern to take medicine in Iran and attempts to reform the patterns were unsuccessful (Ahmadei *et al.*, 2007). Self-medication includes two aspects: first taking permitted and generally known medicines, called

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Over-The-Counter (OTC) which have few side effects. If this group of medicine is taken under the supervision of the experts, they may never create severe side effects. The second group is called Prescription Only Medicines (POM) which have strong side effects and are known as specific medicines. They must be prescribed by a doctor and patients cannot take them on their willing (Jalilian *et al.*, 2013a; Sclafer *et al.*, 1997). Since, self-medication is relative to people's cultural, social, religious and health educational beliefs and since World Health Organization (WHO) and also ministry of health and medical educationin Iran aim to develop proper patterns of medicine taking among people (Davatei *et al.*, 2008), it seems important to recognize various behavioral factors at different levels to predict self-medication. One of the most important aspects of individual behavior is cognitive factors shaping behavior which would be significantly influential to self-medication at individual level. Since, it is impossible to distinguish cognitive factors to behavior without knowing behavior theories and patterns introduced by psychologists, it sounds necessary to make use of the patterns and theories as guides to health training promotion activities to answer questions by planners, e.g., 'why don't individuals behave properly?', 'how to change the behavior?' what factors should be considered to evaluate the program?

On the other hand, many studies suggested epidemiologic studies as the first step to preventive intervention planning (Alavijeh *et al.*, 2015, 2016; Jalilian *et al.*, 2014, 2016; Mousaviraja *et al.*, 2014). Also, students have been known as an in danger group to risky behaviors due to their conditions and stress (Alavijeh *et al.*, 2011; Hosseini *et al.*, 2016). One of the practical patterns to avoid risky behaviors is Prototype/Willingness Model (PWM) which introduces two main theories on behavioral patterns to accomplish risky behaviors among youth. The first theory refers to logical decision making (like theory of reasoned action and planned behavior theory) and the second considers individual's imaginations and willingness in a certain condition as the source to decision making which aims to explain unplanned behaviors. These two theories founded the basis to prototype/willingness pattern by Gibbons *et al.* (1998) which shares some structures such as attitude and social norms with the theory of reasoned action and planned theory. Although, it introduces a similar procedure, the theory includes two new structures called prototype and behavioral willingness.

Due to lack of knowledge on the issue in Iran and also, the importance of distinguishing cognitive factors to self-medication while planning interventions and later, apply them, the present study aimed to investigate medical care students in Shahid Sadoughi Center in Yazd, Iran to distinguish cognitive factors to self-medication using prototype/willingness model.

MATERIALS AND METHODS

It was cross-sectional study investigating 237 students of Shahid Sadoughi University of Medical Sciences, Yazd, Iran during 2015. To collect the required samples, various collages were considered as clusters and samples were randomly chosen proportional to size in each cluster. Samples were asked to fill out a questionnaire developed to the purpose of the present study on underlying and cognitive factors to the self-medication based on prototype/willingness patterns. The required data were collected in form of self-reporting. Respondents were informed about the security of provided data. Removing the incomplete questionnaires, 213 questionnaires were analyzed (response rate was 89.8%).

This study has been approved by the Institutional Review Board at the Shahid Sadoughi Medical Sciences and Health Services University (IR.SSU.SPH.REC. 1395.29).

The developed questionnaire included two parts. first, underlying information with 15 questions on students personal information: age (year), gender (male, female), college (Health, Paramedical, Medicine and Pharmacy, Dentistry, Nursing and Midwifery), education grade (undergraduate, graduate, doctoral and special professional), marital status (married, single), insurance (yes, no), having certain diseases (yes, no), living in a hostel (yes, no), smoking (yes, no) and taking medications during the past month (yes, no).

Second part includeditems on prototype/willingness patterns. The research team made use of the theory-based studies (Gibbons *et al.*, 1998; Ataee *et al.*, 2014; Alavijeh *et al.*, 2013) to develop relative items to prototype/willingness pattern in a 5-likert-scale. Doing the initial reforms relative to illustrative questions concerning their ambiguity, long and partial reforms, several experts were consulted to re-examine the validity of the items; obtaining comments and content validity of the questionnaire, reforms were made. To check the reliability of the questionnaire, a pilot study was conducted among 25 similar students; using Cronbach's alpha reliability of the questionnaire was confirmed as follows.

Attitude towards self-medication contains five items, for example, "I am doing self-treatment to save costs. "The higher the scores, the more positive the attitudes of the individual are to self-medication. Cronbach's alpha coefficient of the questionnaire was 0.73. Persuasive subjective norms to self-medication contains four items, for example "self-medication is common among my friends. "Earn a higher score indicates more subjective norms, encouraging self-medication. Cronbach's alpha coefficient was calculated 0.62.

Individuals' prototyping to self-medication includes 8 items to study students' attitudes to those who commit self-medication. Items aim to investigate factors such as being inexperienced, brave, selfish, self-confident, intelligent, lazy, independent and effective. Cronbach's alpha was 0.72.

Behavioral tendencies regarding drug use include the four items to investigate individual's reaction to suggestions to self-medication, for example "I accept and take the medicine." Cronbach's alpha was 0.66.

Self-medication treatment plan also includes four questions. For example, "I want to self-medicate to save costs since next week. "A higher score indicates more behavioral intention to self-medication. Cronbach's alpha coefficient was calculated 0.72. Data were analyzed by SPSS Version 21 using appropriate statistical tests including chi-square, t-test, bivariate correlations and regression at 95% significant level.

RESULTS

The mean age of respondents was 21.9 years [SD: 2.41], ranged from 18-30 years. Almost 45.1% of the participants had self-medication. There was a significant correlation between health insurance and self-medication ($p = 0.004$). In addition was a significant correlation between smoking and self-medication ($p = 0.003$). However, there was no significant difference between self-medication and gender, school of study, educational level, marital status and living in dormitory (Table 1).

Table 2 shows the zero-order correlations. Significance levels at the 0.01 and 0.05 were the criteria for the analysis. As can be seen in Table 3, attitude, subjective norms and prototype variables were statistically significant for predicting self-medication which they were accounted for 41% of the variation in self-medication behavior intention and 15% of the variation in behavior willingness to self-medication.

Finally, a logistic regression (backward stepwise method) building procedure was conducted and finally on 3rd step, the procedure stopped and the best model was selected. Among the constructs, attitude, subjective norm and behavior intention were the most influential predictive factors for self-medication (Table 4).

Table 1: Demographic characteristics influencing on self-medication

Criteria	Self-medication Mean (SD), N (%)		p-values
	Yes	No	
Age	21.63 (2.14)	22.13 (2.60)	$t = 1.519, p = 0.130$
Sex	48 (42.9)	64 (57.1)	$X^2 = 0.467, p = 0.494$
Female			
Male	48 (47.5)	53 (52.5)	
School			
Health	37 (53.6)	32 (46.4)	$X^2 = 4.048, p = 0.543$
Paramedical	22 (40)	33 (60)	
Medicine	10 (45.5)	12 (54.5)	
Pharmacology	8 (44.4)	10 (55.6)	
Dentist	6 (31.6)	13 (68.4)	
Nurse	13 (43.3)	17 (56.7)	
Education level			
BSc	70 (48.3)	75 (51.7)	$X^2 = 1.659, p = 0.198$
MD	26 (38.8)	41 (61.2)	
Marital status			
Married	1 (12.5)	7 (87.5)	$X^2 = 3.554, p = 0.059$
Single	94 (46.3)	109 (53.7)	
Living in dormitory			
Yes	54 (42.5)	73 (57.5)	$X^2 = 0.827, p = 0.363$
No	42 (48.8)	44 (51.2)	
Insurance			
Yes	65 (39.6)	99 (60.45)	$X^2 = 8.510, p = 0.004$
No	31 (63.3)	18 (36.7)	
Smoking			
Yes	11 (84.6%)	2 (15.4%)	$X^2 = 8.745, p = 0.003$
No	85 (42.5%)	115 (57.5%)	

Table 2: Correlation between different components of prototype willingness model

Components	X_1	X_2	X_3	X_4
X_1; Attitude	1			
X_2; Subjective norms	0.145*	1		
X_3; Risk images	0.304**	0.222*	1	
X_4; Behavioral willingness	0.319**	0.206**	0.291*	1
X_5; Behavioral intention	0.560**	0.183**	0.460**	0.353**

*, **Correlation is significant at the 0.05 and 0.01 level (2-tailed)

Table 3: Hierarchical regression analyses predicting willingness and intention to self-medication by attitude, subjective norms and prototype

Variables	B	SE (B)	β	t-value	p-value
Willingness (final model, step 2)					
Attitude	0.418	0.049	0.472	8.452	<0.001
Prototype	0.265	0.047	0.316	5.655	<0.001
Intention (final model, step 1)					
Attitude	0.229	0.064	0.239	3.551	<0.001
Subjective norms	0.189	0.106	0.118	1.785	0.076
Prototype	0.175	0.062	0.192	2.807	0.005

$R^2 = 0.15, 0.41$; $F = 12.496, 73.153$; $p < 0.001$

Table 4: The correlation between different components of prototype willingness model and self-medication

Variables	Odds ratio	CI 95%		p-values
		Lower	Upper	
Final model, step 3				
Attitude	1.109	1.010	1.218	0.030
Subjective norm	1.127	0.986	1.288	0.080
Intention	1.181	1.057	1.320	0.003

DISCUSSION

Identifying and analyzing the factors associated with self-medication among different groups in society seems very important. It is hoped that analyzing the result from the present study based on given goals, theories and variables in comparison to results from similar studies could introduce some efficient solutions to prevent self-medication in Iran.

Results from the present study suggested that 45.1% of participants reported self-medication. Other similar studies in Iran reported 32-38% of self-medication prevalence (Moghaddam, 2007; Davatei *et al.*, 2008; Jalilian *et al.*, 2013b). These studies reportedhigher prevalence of self-medication in Iran than other countries. Considering the high prevalence of self-medication it seems necessary to plan educational programs in the field among different segments of society, especially students who are the future of society and the country.

Our findings also showed that self-medication is higher among the uninsured; not having health insurance could make it difficult for people to access medical care services and is a major factor for self-medication. These results are consistent with the findings of similar studies in this area (Jalilian *et al.*, 2013a, b). The findings of this study did not suggest a statistically significant

relationship between gender and self-medication. Various studies reported different results for the effect of gender. Ahmadi (2007) and Nunes de Melo reported no meaningful relationship between self-medication and gender. However, Figueiras *et al.* (2000) suggested that self-medication was more common among females.

Also no statistically significant relationship was reported between age and self-medication which can be indicative of homogeneity of the study population since there was no large age difference among the participants of the study.

Considering the main goal of the present study, the results indicated that structures such as attitudes, subjective norms and perceptions of risk respectively predicted 41 and 15% of the variance in behavioral intention and behavioral tendencies to self-medication. Pomery showed that the relationship between desire and consumption up to 17-18 years is stronger than the connection between intention and consumption but it is not true at older ages (Pomery *et al.*, 2009. Results from the present study indicated that self-medication among Iranian youth was not mainly predicted by behavioral tendencies and structures such as attitudes, subjective norms and notions of risks reported a higher variance of behavioral intention to behavioral tendencies; these results corresponded to the results from Alavijeh *et al.* (2013) which suggested prototype/willingness model as a stronger predicator to behavioral intention to drug abuse.

The findings related to logistic regression analysis showed that the structures such as attitude, subjective norms and intention were more powerful predictors of self-medication. Several studies focused on the importance of mentioned structures to predict behaviors (Jalilian and Emdadi, 2011; Matin *et al.*, 2014; Morowatisharifabad *et al.*, 2013; Moghadam *et al.*, 2012). Therefore it seems essential to consider these factors to planning interventions to get better results.

A limitation of this study was that the required data was gathered through questionnaires (which can always be associated with the percentage of error). Also, reliability of behavioral tendencies structures was relatively low. This study investigated a group of medical students in Yazd, Iran and cannot be generalized to other students.

CONCLUSION

The results showed there is some support to use the prototype willingness model to design and implementing educational programs to reduce self-medication.

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