



Prioritizing the Factors Affecting the Abuse of Pharmaceutical Opioids by Applying Topsis

Farahnaz Zeinali *, Mehdi Mohammadzadeh, Jamshid Salamzadeh

*Department of Pharmacoeconomics and Pharma Management, School of Pharmacy, Shahid Beheshti University
of Medical Sciences, Tehran, Iran*

Abstract

Human societies have witnessed the phenomenon of ever-increasing use of pharmaceutical opioids for a long time. Moreover, cultural, social, and economic aspects in any community have undergone the negative effects of the growing tendency toward opioids addiction. Since abusing pharmaceutical opioids is a serious problem, it is important to recognize and prioritize the factors influencing this abuse. This paper concentrates on assessing the priorities of variables which have effects on the abuse of pharmaceutical opioids in order to help the policy makers to make correct decisions to reduce the abuse of opioids. Topsis is applied as a method for Multi-Attribute decision making, which prioritizes alternatives in a simple but efficient way. Topsis method identifies the closeness of each alternative to the ideal solution. In this method, each alternative should have the shortest distance from the best solution and the farthest distance from the worst solution. According to the findings, “family role” and “extra prescription” are the most important factors in variables.

Key words: Pharmaceutical opioids, Abuse, Topsis, Prioritization, Affecting Factors, Iran

Corresponding Author: Farahnaz Zeinali, Department of Pharmacoeconomics and Pharma Management, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Tel: (+98)21-88665692

E-Mail: fa@zeinali80@yahoo.com

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1. Introduction

The ever-increasing abuse of pharmaceutical opioids is a social evil that has afflicted many societies. Despite the fact that people's awareness has been increased, this problem has expended more and more in such countries. This growing inclination towards the addiction to pharmaceutical opioids has had detrimental impacts on economic, social, and

cultural aspects in these societies [1]. A research in the United States suggested that misusing pharmaceutical opioids increased from 1996 to 2011, while the use of illicit drugs decreased in the same period [2]. Much attention has been paid to the use of such illicit drugs as heroin and cocaine, for instance, but pharmaceutical opioids have generally been ignored [3].

It is obvious that the increase in using pharmaceutical opioids by patients results in an increase in abuse, misuse, and diversion [4]. Pharmaceutical opioids play a key role in relieving the pain of cancer patients and, in the past few years, they have been increasingly used for chronic non-cancer cases [5]. Using such pharmaceutical opioids may be considered as a good means of comforting patients. However, later, they can cause the patients to undergo some difficulties [6]. The use of opioids for a long time can lead to patients' dependency on and addiction to opioids, and eventually it may result in their death.

Reports demonstrate that in 2009, 2.1% of the US population abused pharmaceutical opioids. Furthermore, from 1999 to 2006, due to using opioids, the rate of mortality rate increased threefold [7]. In 2007, a strategy named "the risk evaluation and mitigation strategy" (REMS) [8] was employed by the Food and Drug Administration (FDA), which was used for effective medicines with serious risks. Based on REMS, those who produce such medicines are supposed to let physicians know about proper prescription as well as users' misuse and their dependency on them

[9]. There is, unfortunately, still no evidence indicating that REMS has been effective in reducing the use and abuse of the pharmaceutical opioids [10]. The efforts made by policy-makers in order to reduce the overuse and misuse of pharmaceutical opioids and manage them have, thus far, been unsuccessful [10]. Therefore, policy-makers require some necessary tools and interventions to be able to recognize these problems and address them properly. This paper aims to assess the priorities of variables which have effects on abusing pharmaceutical opioids. The Topsis method is applied to identify the closeness of each alternative to the ideal solution and to prioritize them.

Topsis

Chen and Hwang (1992) presented a method named Topsis (Technique for Order of Preference by Similarity to Ideal Solution). Topsis is applied as a method for multiple attribute decision making (MADM), which prioritizes alternatives in a simple but efficient manner [11]. In this method, each alternative should have the shortest distance from the best solution and the farthest distance from the worst solution [12]. Topsis includes the following steps: 1- All of the criteria should be standardized.

2- Weights of each criterion should be calculated based on Shannon's entropy. The importance of criteria is shown by their weight.

3- The ideal alternative and the worst alternative should then be determined.

4- The distance of each criterion from both the ideal and negative ideal alternative should be measured.

5- Relative closeness of each alternative to the ideal solution should be determined through this formula.

$$CL_i^* = \frac{d_i^-}{d_i^+ + d_i^-}$$

6- All the alternatives should be ranked according to the number of CL in 6[13, 14]. Generally, an advantage of Topsis is finding out the best alternative in decision makings, which helps the decision makers to choose the best alternative in their decisions.

2. Materials and Methods

In this study, the alternatives affecting pharmaceutical opioids abuse were obtained from literatures and experts' opinions.

Based on the experience and knowledge of experts, a conceptual model was extracted[15]. To do this, ten distinguished experts were invited, all of whom were competent in treating chronic diseases and addiction. In addition, some experts, with at least 5 years of experience, who took part in Iran Drug Control Headquarters and in Iranian National Center for Addiction Studies participated in this stage of study so that we would have a more comprehensive view. Through an interview, these experts shared their opinions about the factors in this regard and the relationships among them. First, the initial variables were obtained from the experts' opinion and literatures. Afterward, several meetings were organized, and the experts discussed and

compared their opinions concerning variables in these meetings. Finally, the ultimate variables were extracted.

After determining variables, a questionnaire was prepared according to these variables. The questionnaire was prepared on a 7-point Likert scale according to Topsis technique so that the alternatives which affected pharmaceutical abuse would be prioritized. The questionnaire was validated by using of content validity techniques by asking opinion of the experts regarding comprehensiveness, relevance, clarity, and also scoring of all questions. After validation of the questionnaire, for the reliability of it, it is used cronbach alpha test and calculated cronbach alpha index for questions separately. The level of index for accepted questions was 0.75.

In order to reply the questionnaire, 200 chronic cancer patients who referred to Food and Drug Departments of Tehran universities were selected.

3. Results and Discussion

In this study, the initial variables were obtained from the experts' opinion and literatures. Then, several meetings were organized in which experts discussed these variables and compared their opinions about them. Finally, the ultimate variables were extracted. This is indicative of the key role that experts played in developing variables.

Some reasons, extracted through the variables, affecting pharmaceutical opioids abuse were as follows:

- Every year, patients suffering from pain take pharmaceutical opioids to decrease their pain.

If their pain grows stronger, they take a higher rate of opioids, which may expose them to the abuse of opioids and may make them addicted to them.

- According to experts' declaration, confronting the patients whose addiction increases, physicians pay attention to risks and try to prescribe low-risk opioids.

- Additionally, in some countries, FDA has successfully prepared guidelines to control opioid abuse, but some physicians do not care about the guidelines prepared by the FDA and may prescribe high rates of long-acting opioids to reduce their patients' pain.

- In order to prevent and control drug abuse, in countries, policy makers make hard and fast regulations for physicians. As these physicians may worry about the potential penalties, they have a tendency to prescribe low-risk opioids; the use of high-risk opioids will be decreased.

- One of the factors that affect the abuse of pharmaceutical opioids is extra prescription. Addicted patients always have opportunities to obtain extra opioids. One of the ways that patients prepare extra prescription is doctor shopping, which is described as "the practice of visiting multiple physicians to obtain multiple prescriptions for the same pharmaceutical opioids[16]."

According to some research, diversion of pharmaceutical opioids from prescriptions is the principal agent of supply for abusing them[17]. A number of extra opioids may be diverted to illegal addicted people instead of being given to chronic patients. As a result, due to extra prescriptions, the accessibility of pharmaceutical opioids will increase.

- Sometimes the shortage of prescriptions, for any reason, increases patients' motivation for taking extra prescription, so they try to prepare more extra prescriptions.

- Family role is an important factor in the abuse of pharmaceutical opioids. Relationship to addicted people in the family or friends increases the risk of opioids abuse.

On the other hand, worries about and fear of addiction among patients are the main factors that prevent opioids abuse.

Instructing patients based on the correct usage of pharmaceutical opioids reduces opioids abuse as well.

Some addicted people have wrong beliefs about pharmaceutical opioids. They think that the risks of taking opioids are more than those of illicit drugs. Making these people aware of their wrong beliefs about the safety of pharmaceutical opioids can reduce the overuse and misuse of them.

In this study, after determining the variables, the questionnaire which was designed based on these variables was distributed among the patients in order to prioritize the alternatives which affect pharmaceutical abuse.

As it is mentioned in table 1, the distances of each alternative from both the most ideal and the negative ideal alternatives were calculated. Afterwards, their relative closeness to the best solution was determined.

As it is shown in table 2, family role has the greatest influence, and accessibility has the least effect on surveying pharmaceutical opioids abuse.

Table 1. Determined distances of variables from the ideal and negative ideal alternatives.

Alternatives	di+	di-	CLi	Ranking
Pay attention to risk	12.86486	12.86486	0.483636	3
Extra prescriptions	6.573318	19.75371	0.750321	2
Family role and relation	4.347368	24.80213	0.85086	1
Education	14.49884	10.81666	0.427274	4
Desire	16.97067	7.189644	0.417581	5
Regulations	22.53491	6.123465	0.213671	7
Accessibility	28.32854	2.276462	0.074382	8

Table 2. Prioritization of alternatives.

Alternative	Sorted CLi
Family role	0.85086
Extra prescriptions	0.750321
Pay attention to risk	0.483636
Education	0.427274
Desire to use	0.417581
Regulations	0.213671
Accessibility	0.074382

As it was expected, the patients who were related to addicted people, as compared to others, were more inclined to abuse opioids. However, according to a study carried out in the USA, family role does not play an important role in the abuse of opioids[18].

In this study, reducing extra prescription, which is related to physicians' intervention, leads to a decrease in the abuse of opioids. In another study which was done in the USA, it was suggested that over half of opioids

overdose was due to diversion from the patients who prepared extra prescription [19].

According to table 2, paying attention to risks was also the next priority in physicians' interventions. In a similar research, directing the attention of patients toward risks led to reducing the rate of death due to overdose [18].In this ranking, desire to use and education variables in patients' intervention stood somewhere in the middle concerning their influence on opioids abuse. However, in another study, the tendency to use has the most

important influence on the abuse of opioids. The study suggests that reducing the rate of initial use for nonmedical users has a more important effect than reducing the rate of abuse among medical users [20].

On the whole, this study revealed that regulations did not have an important role in reducing pharmaceutical opioids. In a similar research in the USA; however, regulations prevented the rate of overdose in nonmedical users. Interestingly, it led to an increase in the number of patients who suffered from overdose. This may happen when the overdose of nonmedical users decreases; physicians do not pay attention to the risk of opioids and begin to raise the dose of opioids. As a result, the number of the patients who overdose will increase (20). Although hard regulations have not been a determining factor in reducing the abuse of pharmaceutical opioids, they may let the society enjoy the benefit of decreasing the transmission of serious infections—such as HIV, hepatitis B and C, septicemia, abscesses, and thromboembolic diseases—due to using infected syringes (20).

Finally, as it was mentioned earlier, accessibility carried little weight in this study. In another research which was conducted in Iran, it was mentioned that the strategy of controlling the demand works better than controlling the supply. That is, there will not be any supply unless the demand grows. The evidence supporting this claim can be seen in the abortive efforts made by policy makers to control the abuse of opioids by controlling drug trafficking [1].

4. Conclusion

The present study mainly focused on the assessment of the priorities of those variables which have an effect on abusing pharmaceutical opioids. The Topsis method was applied to identify the closeness of each alternative to the ideal solution and prioritized them. According to our findings, “family role,” which is related to patients’ intervention and “extra prescription,” which is related to physicians’ intervention are among the top priorities.

The aim of prioritizing the variables is helping policy makers to make a good decision in order to reduce the abuse of pharmaceutical opioids. It also provides stakeholders with a comprehensive perspective on the issue of pharmaceutical abuse so that they can take some measures to overcome unexpected consequences in the societies where the risk of abuse is high.

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