



## Excessive use of Paracetamol to relieve pain and its life-threatening effects in the human body (Qualitative research from Sar-e-Pol Province)

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### Abstract

Today, there are various treatments to reduce pain, each of which has its own efficiency and effectiveness. These methods include the administration of painkillers such as paracetamol and Diclofenac. The purpose of this research is the excessive use of paracetamol to relieve pain and its side effects in the long term, which was conducted with a qualitative method and a descriptive Phenomenological strategy in Sar-e-Pol Province. A number of 20 female patients were selected using purposeful sampling based on Snowball until reaching theoretical saturation. The method of data collection was done through semi-structured interviews and the information obtained from the interviews and it is analyzed based on the 7-step Colaizzi method. The findings of this research are obtained in the form of 80 concepts, 5 sub-themes and 2 main themes. The applicability of the drug Paracetamol and the ignorance of its side effects. The general results obtained show that overuse of Paracetamol causes diseases such as: yellow skin or eyes, diarrhea, anorexia, vomiting, stomach pain, swelling, upper abdominal sensitivity, black or bitumen color stools, bloody or dark urine, sudden decrease in urine, unusual bruising or bleeding, mouth sores and sore throat and will cause it to have no effect on the body in the long run.

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### Introduction

Pain is one of the problems that always bothers people and has many unwanted side effects. According to the definition of the International Association for the Study of Pain (IASP), pain is an unpleasant emotional and sensory experience with potential or actual tissue damage. Meanwhile, one of the worst pains that humans endure is acute postoperative pain, and the more intense this pain is, the more unfavorable hemodynamic and metabolic responses it causes for patients <sup>[1-2]</sup>. Today, there are various treatments to reduce pain, each of which has its own efficiency and effectiveness. These methods include painkillers such as paracetamol and Diclofenac, and it can be necessary to compare different methods of pain relief to choose the best treatment method, and although there are other drugs to prove the effectiveness of each one compared to a placebo, the drug cannot be shown completely. Gave compared with placebo. The use of non-opioid pain relievers such as paracetamol has fewer side effects than opioid pain relievers <sup>[3-4]</sup>. Paracetamol was obtained for the first time in 1878 from the oxidation reaction of *para-nitrophenol* with tin, but it did not find therapeutic use until 1893. It was in this year that paracetamol was identified in the urine of people who had taken phenacetin, and it was announced that paracetamol was the result of the metabolism of acetanilide, but this discovery was not noticed much. Finally, in the investigation of hemoglobin disease, a state in which the blood loses its ability to carry oxygen and leads to death, the cause of this disease was linked to the consumption of acetanilide, and the researchers emphasized that the effects of acetanilide as a pain reliever are due to the active metabolism of this substance. it is produced. This substance was the same as Paracetamol, which was found to not have the negative effects of acetanilide and can be used as its substitute <sup>[5]</sup>. Therefore, Paracetamol is one of the drugs that are usually prescribed in most prescriptions to treat

colds and influenza. Taking this medicine according to the dose recommended by the doctor is not dangerous, but taking too much of it can lead to liver poisoning.

As in western countries, the most important cause of liver failure is poisoning caused by paracetamol. In the meantime, it has been observed that the consumption of alcoholic beverages adds to the poisoning with paracetamol. Some drugs that do not have many side effects are freely available to everyone without a doctor's prescription; however, if their permitted consumption is not taken into account, they can cause serious damage. Paracetamol, which is sold under the brand name acetaminophen, is one of these drugs. Paracetamol or acetaminophen tablets are usually taken arbitrarily without a doctor's prescription. These drugs may harm the body in the long run. Because no matter how effective and vital chemical drugs are in human life, they will also have their disadvantages. Painkillers are among the favorite drugs of the people of Afghanistan and other countries. It is said that the consumption of Paracetamol in Afghanistan is about 100 million tablets per year. Women consume more than men. Between 1978 and 1988, the use of this pill in other countries has increased 5 times. In the United States of America, it has reached more than 200 grams per

person per year. In the UK, over-the-counter paracetamol purchase rates have been reported to range from 2 billion to 3.5 billion 500 mg tablets per year [6]. Therefore, the increasing use of painkillers in the world and the ignorance of consumers about the possible long-term side effects of these drugs led to the writing of this article. Knowing its side effects will probably reduce the risk of death caused by the arbitrary use of painkillers.

### Research Method

In this research, a qualitative approach to descriptive phenomenology was used. In order to reflect the mentality of people and the meaning they give to taking medicine instead of having predetermined assumptions.

### The Studied Community

The research population includes all patients of Sar-e-Pol Province who continued to take Paracetamol without a doctor's prescription. Sampling in qualitative research is mainly purposeful; That is, the participants are selected purposefully, which is shown in Table (1) below the demographic characteristics of the participants.

**Table 1:** Demographic characteristics of participating patients

No	Nick name	Age	Job	Education degree	duration of illness	The duration of using the drug Paracetamol	Interview place
1	Zainab	45	Housewife	illiterate	One week	two weeks	Sar-e-Pol Hospital
2	Parvana	23	Student	Bachelor	ten days	One week	Sar-e-Pol Hospital
3	Nooriya	25	Housewife	illiterate	two weeks	four weeks	Sar-e-Pol Hospital
4	Donya	21	Student	Bachelor	One Month	One week	Sar-e-Pol Hospital
5	Marzieh	22	Teacher	Bachelor	One week	three weeks	Sar-e-Pol Hospital
6	Shagoufa	25	Housewife	illiterate	six months	six weeks	Sar-e-Pol Hospital
7	Hanana	35	Housewife	Associate's degree	One week	six weeks	Sar-e-Pol Hospital
8	Ayesha	26	Student	Bachelor	One week	six weeks	Sar-e-Pol Hospital
9	Najiya	29	Housewife	illiterate	four weeks	One Month	Sar-e-Pol Hospital
10	Mrs. Heydari	20	Student	Bachelor	three weeks	three weeks	Sar-e-Pol Hospital
11	Atefa	22	Student	Bachelor	One week	two weeks	Sar-e-Pol Hospital
12	Zahra	29	Embroiderer	Associate's degree	One Month	One week	Sar-e-Pol Hospital
13	Masouda	22	Tailor	Bachelor	two weeks	three weeks	Sar-e-Pol Hospital
14	Samira	21	Student	Bachelor	One Month	two weeks	Sar-e-Pol Hospital
15	Latifa	30	Housewife	illiterate	three weeks	three weeks	Sar-e-Pol Hospital
16	Aqeela	23	Student	Bachelor	One week	two weeks	Sar-e-Pol Hospital
17	Ruqiyya	35	Housewife	illiterate	One week	three weeks	Sar-e-Pol Hospital
18	Fatema	42	Housewife	illiterate	four weeks	One week	Sar-e-Pol Hospital
19	Sharifa	43	Tailor	illiterate	three weeks	One week	Sar-e-Pol Hospital
20	Mahbuba	41	Embroiderer	illiterate	One week	two weeks	Sar-e-Pol Hospital

In this research, the average age of the patients (the youngest age is 20 years and the highest age is 45 years). The average duration of the disease (the minimum duration is one week and the highest duration is six months). The occupations of the patients were (40% housewives, 35% students, 5% teachers, 10% embroiderers and 10% tailors). The level of education is (45% bachelor's degree, 45% illiterate and 10% of them Associate's degree). The duration of the patients' use of the drug Paracetamol (the minimum duration of use was one week and the highest duration of use was six weeks).

### Sampling

Sampling in this research is selected on a purposeful and snowball basis according to the subject under study and the qualitative research method with a phenomenological approach. That is, those people who had the necessary conditions for the interview is selected, and then by

introducing them, we went to more samples. The number of samples was considered based on the principle of saturation. The sample population of the study was selected from among the people who voluntarily took paracetamol for pain relief and were willing to participate in the study .

### Data Collection Method

In this research, according to the type of research and the method that requires a qualitative approach with phenomenological method; semi-structured interview has been used as a data collection tool. The method of conducting this research included selecting a sample and giving the necessary information about the purpose of the research to the participants, and after their consent and ensuring the confidentiality of their information, recording permission was obtained, and the interviewees were asked a list of questions that had been prepared in a sequence. He answered

questions regularly. The main focus of the interview questions was to discover the experience and interpretation they had of taking paracetamol for pain relief, and the interview time varied from forty minutes to one and a half hours depending on the respondent's cooperation and the answers he gave to each question. The interviews went on until reaching the saturation point, that is, no new information is obtained by taking any other interview, and the content only repeats the previous results of the previous information. The next step was to conduct the interview and read the interview text several times and analyze it.

### Data Analysis Method

In phenomenological research, the purpose of data analysis is to provide an analytical and comprehensive description of the phenomenon under study so that the experiences of the participants are reflected through it. The method of data analysis in this research is Collaizi method which has 7 steps. According to Collaizi 7 stages, in the first stage of this research, the researchers listened to the recorded interviews many times in order to understand the inner feelings and hidden meanings, and their statements were typed in Word. In the second stage, the researchers re-read the texts several times and after describing the meaningful information, a yellow line was drawn. In the third stage, after checking to find the topics and meanings of the units and understanding the nature of the participants' experiences and searching to determine the important and meaningful statements and the relationship between the topics, each phrase was tried to extract a concept that expresses the meaning of the participants' thinking. The fourth step, after extracting the codes, the developed concepts were carefully studied and based on the similarity of the concepts, their number was categorized. In the fifth step, the categories of the previous step were linked together for a better and related description, and more general categories were created. These categories are due to the 2 main themes of the applicability of paracetamol and ignorance of its side effects. In the sixth step, a comprehensive description of the studied phenomenon was given as clearly and unambiguously as possible. The

seventh step, validation was done with reference to each sample; the results were explained to the participants and they were asked to share their opinions about the results.

### Ethical Considerations

It was explained to the participants that there was no obligation for their participation and that they would not receive any financial benefits for it. It was also explained that if they are not satisfied, they can withdraw whenever they want or they don't want their interview results to be published. Do not feel pressured during the interview.

### Findings

Two main themes were extracted from the data of participating patients, which are:

1. The applicability of the drug Prestamol
2. People's lack of awareness of the side effects of Prestamol

In the following, each main theme is described according to the patients' perception:

#### 1- The Main Topic: The Applicability of the Drug Paracetamol

The widespread use of paracetamol tablets due to its analgesic, antipyretic and sedative properties, the use of high doses during the day from one 500 mg tablet to five 500 mg tablets and the body's lack of reaction to excessive use, the lack of drug interactions, low harm with short-term use, self-treatment, cheap and accessible, as well as the use of paracetamol tablets by relatives and friends with little pain and relief from this drug, it is widely recommended to other people to relieve pain, in most cases, even the doctors of secondary and main clinics and health centers prescribe paracetamol tablets to their clients who complain of mild to severe headache and pain in order for them to recover, these factors have made paracetamol tablets popular among people. and can even be found in grocery stores and peddlers on the street, and in the face of the slightest fever and physical pain, he got help from this pill.

**Table 2:** Concepts, sub-themes and main theme

Concepts	Subtopics	Main content
Paracetamol is a painkiller, pain management, regular use, relief from pain, intoxicating, different types of Paracetamol, syrup, different pills, sleeping peacefully after use, aggravation of pain due to the disappearance of the effect of the drug, numbness of severe pains.	The pain relief of the drug	The applicability of paracetamol
Less harm compared to other drugs, the low family economy to get better drugs, the necessity of using the drug Paracetamol, the percentage of harm, high use, daily use, it is always used, prescribing clinics, the time of pain and headache, the normality of daily use, severe pains.	Excessive use of drugs	
Medicine for headache, being feverish, being in pain, having a headache, intensification of pain, using medicine immediately when the headache starts, catching a cold, cold, fatigue, forcing, relieving pains.	For all kinds of pains	

Below is a brief description of the main categories and subcategories along with quotes from participating patients.

#### Paracetamol is a Painkiller

Those who are aware of the analgesic effect of paracetamol and use it mostly to relieve pain such as headaches, aches, high fevers, and muscle cramps without considering its side effects, say in the context of Zainab: (Yes, a tablet) "Blue is paracetamol, yes, paracetamol is a tablet that is a pain reliever. We buy it from the market or take it from the store, it relieves".

Parvana says: "Paracetamol is a type of pain reliever that relieves pain and reduces fever so that one can sleep easily, and everyone uses it".

Nooriya says: "Paracetamol is for pain relief, I don't know what's the use anymore".

Shagoufa states: "The only thing I understand about paracetamol is that it numbs the pain and the body doesn't hurt after taking it".

Hanana says: "I understand from paracetamol that it can calm the pain for a very short time and make the person comfortable".

Ayesha says: "In my opinion, paracetamol is a pain reliever. and the pain will be relieved, maybe for a short time".

Mrs. Heydari says: "Paracetamol is a painkiller and is used

for all pains, I also use it whenever".

Atefa says: "paracetamol is a pain reliever with a blue coating, it can be found in many different types, everywhere, anytime".

Zahra says: "It is a pill; it relieves the pain and is good for us".

Masouda declares: "Ahhaaa, pain reliever. It contains narcotic substances that make us drunk by eating it. It is intoxicating".

Samira says: "Yes, it's a pain reliever, what else can I say, it removes the fever, that's enough".

Latifa states: "It reduces the pain and heals the pain".

Aqeela says: "It is a painkiller, there are tablets and syrups, it is used for children, in short, it reduces the pain".

Marzieh states: "What is Paracetamol? It means it is a painkiller and reduces fever, pain, etc".

### Excessive use of Paracetamol

The use of paracetamol in society is high, almost 99% of people use it, but they have no knowledge of its side effects in the long term and continue to use it. There are even those who have been using paracetamol for years. In relation to this question: what do you use Paracetamol for; He gives such answers.

Mahbuba states: "Ahem, I used it, I use it often".

Fatema says: "Yes, I used it a lot, the clinic gives it to us".

Sharifa says: "Yes, I used too much; I remember using it since it was introduced until now".

Ruqiyya says: "Yes, I used it a lot, I use it every time".

Marzieh states: "I use it every day, every time my head or body hurting, I use it".

Zainab says: "Yeah, I used it a lot, I used it a lot, every time, that's usual, hahaha".

### For all kinds of pains

Most of the people in Afghanistan, with headache, fever, body pain, muscle cramps, leg pain, back pain, chest pain, etc., directly use paracetamol to relieve pain in consulting a doctor. In response to this question; when do you most often use paracetamol?

Parvana says: "I use paracetamol when the pain is severe".

Zainab states: "whenever I have a headache or a fever, in a

cold and also when I'm tired, I take a pill and all my tiredness goes away, I got used to it".

Nooriya says: "I will catch a cold, have a headache, and feel lethargic".

Shagoufa says: "When I am in severe pain".

Donya said: "If I have a severe headache that I cannot bear, I use it".

Ayesha says: "I use it when I have a headache, when my body hurts".

Hanana says: "When I have a severe headache".

Najiya states: "any time I get a headache".

Mrs. Heydari says: "When I have bad headache".

Atefa states: "Whenever I get sick, I get bored and I don't get well".

Zahra says: "when I get a bad cold or headache".

Masouda says: "When sick, such as headaches, muscle cramps, body aches".

Samira states: "When I get sick a lot".

Aqeela says: "When I am tired, bored and sick".

Marzieh says: "Whenever my head hurts, when the fever rises, body aches and other times".

Ruqiyya says: "I eat whenever I have a headache or cold".

### 2: The Main Content: People's Lack of Awareness of the Side Effects of Paracetamol

Illiteracy, low level of culture and poverty, lack of medical facilities and equipment, hospitals and modern medical centers for diagnosis and treatment, pharmacies approved by the Ministry of Health and educated pharmacists, counseling centers about the use of drugs and nutrition consultants, specialist doctors and family health advisors, being far from city centers, mountainous and impassable living areas and primitive life in the 21st century, in terms of medicinal properties, the generality of finding paracetamol among people in Sar-e-Pol are the factors that they consider the side effects of paracetamol in the long term (damage kidney and liver, dry skin, states of nausea and diarrhea) are ignorant, of course, not only the drug Paracetamol, but also a large number of drugs such as ibuprofen, codeine, methadon, cold medicine, amoxicillin, and in general, pus dryers are widely used by People come to use, each of which has its side effects in a wide range.

Table 3: Concepts, contents of sub-topic and main topic

Concepts	Subtopics	Main contents
fever reducer, unawareness, addictive, caffeinated medicine, heart damage, heartache, palpitations, eye ache, pain re-intensification, ignorance of harms, pressure reducer, pain relief, no doctor's advice, natural Being the use of medicine, being normal, the purpose of the existence of the medicine, stomach ache due to self-use, not needing a doctor and examination, being forced to die, it is enough to have medicine, lack of doctor and health personnel, when shedding more, bad heart Vomiting, empty stomach, not using fruits, headache again, stomach upset, more stomach duty, being weak, using more than one.	Not having enough information	Lack of awareness of the side effects of Paracetamol
Selling medicine, not saying harm, not asking about previous illness, not asking about current illness, before or after eating, not having a good doctor in the country, not having a good doctor in the region, determining when to take the medicine, eating and recovering, having paracetamol in the pharmacy, not asking I am sick and not being guided by doctors, because painkillers are provided by pharmacies and clinics, because of the headache, where is the doctor, the shops and the shops, when is the checkup, I got it from the pharmacy.	Making excuses and not preventing pharmacies	

Below is a brief description of the main categories and subcategories along with quotes from participating patients.

### Not Having Enough Information

Not having enough information to use medicine is one of the most serious problems people face. This has caused most of the people to face various diseases.

Mrs. Heydari says: "Its advantages are that it relieves pain for some time; It makes people addicted, one of its harms is that it increases stomach pain".

Najiya says: "The only good thing about it is that it cures

headache and I don't understand its bad side, I just know that it is harmful".

Atefa says: "Its benefits are, for example, it relieves pain and makes people addicted to it".

Ayesha states: "I understand its benefits, it is used for pain relief, and it also cures a headache, we mostly use it for a headache, and I did not read about its disadvantages, but from my own experience, eating on an empty stomach hurts the stomach".

Hanana states: "The good thing is that it relieves the pain for a while and the bad thing is that it is bad for the stomach".

Shagoufa says: "It numbs the pain at first and then it starts again".

Donya states: "It calms the pain for a short period of time, it is completely addicting, taking paracetamol increases your eye pain".

Nooriya states: "It is used to relieve pain; one of its side effects is stomach ache".

Parvana states: "goodness is that which cures a person's disease, but at the same time as a disease is good, it also causes harm".

Zainab says: "To some extent, I don't know that it is harmful to the stomach and it is cheap compared to other drugs".

Zahra states: "Ah, firstly, it relieves the pain; secondly, it becomes addictive over time and lowers the body's resistance".

Masouda says: "It is harmful to the heart, and relieves pain, its benefit is the same as pain reliever, and it contains caffeine, it is intoxicating".

Samira states: "Too much consumption is harmful; the only good thing is that it relieves my pain".

Latifa says: "Yes, when we eat, the headache will go away, but my heart will tremble".

Aqeela says: "I don't understand it, the purpose of any medicine that is harmful is useful, we only consider its benefits".

Ruqiyya says: "No, I don't understand more; maybe it is harmful for the stomach".

Marzieh says: "Yes, it cures a headache, it lowers a fever, first of all, it is harmful to the stomach, it lowers the body's high resistance".

Sharifa says: "Yes, it cures a headache, it lowers a fever, first of all, it harms the stomach, it lowers the resistance of the body".

Mahbuba says: "Its advantages are that it reduces the pain and its disadvantage is that it creates nausea".

### **Making Excuses and not Preventing Pharmacies**

Medicines are mostly taken by people arbitrarily. Patients do not go to the doctor for normal pain. In insistence and answer these questions: Do you use paracetamol without a doctor's advice?

Hanana says: It is a normal thing to use it, everything is possible".

Atefa says: "Yes, I always use it without doctor's advice; who goes to the doctor because of a headache"?

Parvana says: "Yes, whenever my head hurts, I use it".

Donya says: "Yes, I use it a lot without the doctor's advice".

Shagoufa states: "Yes, it is normal, why do you need to go to the doctor"?

Aqeela says: "Ah, because it is a painkiller, we don't need to get it from a doctor".

Marzieh says: "Yes, I use it on my own, without consulting a doctor".

Sharifa says: "Yes, whenever I use paracetamol tablets without doctor's advice, it is not a problem".

Answer to this question: From where do you get Paracetamol?

Najiya says: "I got it from the pharmacy and I use it".

Aqeela says: "I got it from the pharmacy because it is a painkiller".

Ruqiyya says: "Where is the doctor! My son, whenever we get it from the pharmacy, we use the same one again".

Fatema states: "Yes, who goes to the doctor because of a headache, we get it from the pharmacy".

Mahbuba says: "Where is the doctor, my daughter?, We buy and eat from shops or pharmacies, where else can we get it from?".

### **Paracetamol Warnings and Side Effects**

All spices may cause side effects. But many consumers do not show any side effects. Some of the side effects disappear after a short time of using the spice. But tracking side effects and paying attention to them is very important.

If you experience any of the following symptoms, see a doctor.

- Yellowing of the skin or eyes
- Diarrhea
- Anorexia
- Vomiting
- Stomach ache
- Swelling
- Upper abdominal tenderness
- Black or bitumen color stools
- Bloody or dark urine
- Sudden decrease in urine
- Abnormal bruising or bleeding
- Oral ulcers
- Sore throat [7-8].

### **Discussion**

The findings of the present study show; not having enough information to use medicines is one of the most serious problems people face. However, all painkillers, including paracetamol, are common, available, and self-administered drugs. Paracetamol is a prodrug that is hydrolyzed in the blood. This drug has analgesic and antipyretic effects, which are recommended in different doses (1 and 2 grams [9]). The mechanism of action of this drug is inhibition of prostaglandin synthesis. The first enzyme in the prostaglandin production cycle is cyclooxygenase, which Paracetamol prevents its production by entering the cycle and exerts its analgesic effect [10]. In the context of Goudarzi findings (2014), it shows that morphine has a short-term analgesic effect, but the effect of paracetamol lasts longer in the body [11]. Khalili *et al.* (2013) showed in their study and research that paracetamol injection before surgery has a significant effect on the pain level [12]. Also, Memis *et al.* (2010) obtained the results that Paracetamol is effective in reducing pain [13]. The results of this research are in line with the research of Goudarzi, Khalili *et al.* and Memis *et al.* Finally, according to the general results obtained, overdose of Paracetamol causes diseases such as: yellow skin or eyes, diarrhea, anorexia, vomiting, stomach pain, swelling, upper abdominal sensitivity, black or tarry stools, bloody or dark urine, sudden decrease Urine, unusual bruising or bleeding, mouth sores and sore throat will cause it to have no effect on the body in the long run.

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### References

1. Shang AB, Gan TJ. Optimising postoperative pain management in the ambulatory patient. *Drugs*. 2003;63(9):855-867.
2. Gramke HF, de Rijke JM, van Kleef M, Raps F, Kessels AG, Peters ML, *et al.* The prevalence of postoperative pain in a cross-sectional group of patients after day-case surgery in a university hospital. *Clinical Journal of Pain*. 2007;23(6):543-548.
3. Bhosale UA, Khobragade R, Naik C, Yegnanarayan R, Kale J. Randomized, double-blind, placebo-controlled study to investigate the pharmacodynamic interaction of 5-HT<sub>3</sub> antagonist ondansetron and paracetamol in postoperative patients operated in an ENT department under local anesthesia. *Journal of Basic and Clinical Physiology and Pharmacology*. 2015;26(3):217-222.
4. Alipour M, Tabari M. Paracetamol, ondansetron, granisetron, magnesium sulfate and lidocaine and reduced propofol injection pain. *Iranian Red Crescent Medical Journal*. 2014;16(3):18-20.
5. Shahabi M. Molecules that compliment death!, Paracetamol. *Development of Chemistry Education*. 2013;26(4):29. Available from: <https://www.magiran.com/paper/1144205>
6. Warning RH, *et al.* *Molecules of Death*. 2nd ed. Imperial College Press; c2007:253.
7. Shahabi M. Molecules that compliment death!, Paracetamol. *Development of Chemistry Education*. 2013;26(4):29. Available from: <https://www.magiran.com/paper/1144205>
8. Warning RH, *et al.* *Molecules of Death*. 2nd ed. Imperial College Press; c2007:254.
9. Piguet V, Desmeules JA, Collart L, *et al.* Which analgesic dosage of propacetamol? *Schweizerische Medizinische Wochenschrift*. 1994;124(48):2196-2198.
10. Dejonckheere M, Desjeux L, Deneu S, *et al.* Intravenous tramadol compared to propacetamol for postoperative analgesia following thyroidectomy. *Acta Anaesthesiologica Belgica*. 2001;52(1):29-33.
11. Jabalameli M, Goudarzi L. Preventive effects of intravenous paracetamol in post-partum pain of elective cesarean delivery with spinal anesthesia. *Journal of Isfahan Medical School*. 2014;32(296):1227-1237. [In Persian].
12. Khalili G, Janghorbani M, Saryazdi H, Emaminejad A. Effect of preemptive and preventive acetaminophen on postoperative pain score: a randomized, double blind study in patients undergoing lower extremity surgery. *Journal of Clinical Anesthesia*. 2013;25:188-192.
13. Memis D, Inal MT, Kavalci G, Sezer A, Sut N. Intravenous paracetamol reduced the use of opioids, extubation time, and opioid-related adverse effects after major surgery in intensive care unit. *Journal of Critical Care*. 2010;11(1):1-5.