Relationship between opium consumption and lipid profile in drug addicts and non-addicts on Khrameh cohort study

Najibullah Baeradeh  
Shiraz University of Medical Sciences

Seyed Vahid Hosseini  
Shiraz University of Medical Sciences

Leila Moftakhar  
Shiraz University of Medical Sciences

Fatemeh Jafari  
Shiraz University of Medical Sciences

Masoumeh Ghoddusi Johari  (m.ghoddusi94@yahoo.com)  
Shiraz University of Medical Sciences

Abbas Rezaianzadeh  
Shiraz University of Medical Sciences

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Abstract

Background

Drug abuse is known as one of the most important health, medical, and social problems. Furthermore, this study was performed to evaluate the relationship between opium and lipid profiles.

Methods

This cross-sectional study was conducted on 10,663 individuals, aged 40 to 70, living in Kharameh (south of Iran). Demographic information, lipid profile, and the history of use of opium, alcohol, and cigarettes in participants were investigated. To check the lipid profile, blood samples were taken from all participants. The prevalence of opium use was calculated. Linear regression was used to examine the relationship between opium use and the lipid profile of an individual. A significance level of 5% was considered for the tests, and STATA software was used for analysis.

Result

Among the 10,663 participants in the study with a mean age of 52.2 ± 8.22 years, about 55.7% were women. The prevalence of opium use among the participants in the study was estimated at 16%. Multiple linear regression results revealed no statistically significant relationship between opium use and lipid profile.

Conclusion

Contrary to the beliefs that there are about the effects of opium on reducing lipid profile levels, in our study, there was no correlation between LDL, triglycerides and opium consumption.

Introduction

Drug abuse is known as one of the most important health, medical, and social problems of this century (1, 2). Drug addiction is a serious threat to health in various communities, especially for young people (3). More than 62 million people worldwide use opiates for non-medical reasons, of which nearly 31 million use heroin and opium alone (4). The prevalence of drug use varies around the world and in different countries, cultures, and occupations (5). Opium has long been used in many south-central Asian countries, particularly Iran, Pakistan, Afghanistan, and India, as well as in some parts of South-East Asia (6). Iran is one of the countries with a high share of addicts in the world, so it is estimated that about 4 million Iranians use opium regularly or occasionally (7, 8). According to studies, the prevalence of opium use in Iran varies in different regions, and suffering has been reported between 8.9% and 24.7% (9–11). There are common and unscientific beliefs that opium consumption lowers serum lipids as well
as prevents chronic diseases such as diabetes and cardiovascular disease (12, 13), but most studies have shown that opium use increases the risk of acute myocardial infarction, atherosclerosis, and cardiovascular mortality (14). Additionally, current evidence suggests that opium consumption is associated with an increased risk of laryngeal, lung (13), bladder (15), and upper gastrointestinal cancers (16).

There is much disagreement about the effect of opium on lipid profiles. In one study, cholesterol and triglyceride levels were lower in opium users (17), whereas in Kahonji’s study, cholesterol, triglycerides, and LDL were higher in opium users compared to healthy individuals (18). We expect this study to provide more accurate information in this area so that scientific beliefs can be scientifically answered. Furthermore, this study was performed on a large scale, considering the role of confounding factors such as cigarettes, alcohol, and tobacco that can affect the relationship between opium and the lipid profile.

**Results**

The present study was conducted on 10,663 individuals aged 40 to 70, with a mean age of 52.2 ± 8.22 years. The majority of participants were female (55.74%) and married (89%). The prevalence of opium use in the individuals under study was 16% (CI: 15.3–16.7), and 25.35%, 5.1%, and 5.3% of the individuals under study used cigarettes, hookah, and alcohol, respectively (Table 1). Also, a statistically significant difference was seen in different levels of gender, occupation, education, SES, married status, BMI, smoking, alcohol, and hookah consumption between opium users and non-users (Table 1).
Table 1
Distribution of demographic characteristics among opium users and non-users in the population of 40 to 70 years of Kharameh

<table>
<thead>
<tr>
<th>Variable</th>
<th>Class</th>
<th>Total</th>
<th>Use opium(N%)</th>
<th>Non-use opium(N%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>4719(44.26)</td>
<td>1733(36.72)</td>
<td>2986(63.28)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>5944(55.74)</td>
<td>73(1.23)</td>
<td>5871(98.77)</td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td>Unemployed</td>
<td>5147(48.27)</td>
<td>303(5.8)</td>
<td>4844(94.11)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Employed</td>
<td>5516(51.73)</td>
<td>1503(27.25)</td>
<td>4013(72.75)</td>
<td></td>
</tr>
<tr>
<td>Married status</td>
<td>Single</td>
<td>216(2.03)</td>
<td>13(6.02)</td>
<td>203(93.98)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>9492(89.02)</td>
<td>1761(18.5)</td>
<td>7731(81.45)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Widow</td>
<td>896(8.04)</td>
<td>26(2.9)</td>
<td>870(97.1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
<td>59(0.55)</td>
<td>6(10.1)</td>
<td>53(89.83)</td>
<td></td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>Low</td>
<td>2667(25.01)</td>
<td>402(15.07)</td>
<td>2265(84.93)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>2977(27.92)</td>
<td>408(13.71)</td>
<td>2569(86.29)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>high</td>
<td>2539(23.81)</td>
<td>426(16.78)</td>
<td>2113(83.22)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very high</td>
<td>2480(23.26)</td>
<td>570(22.98)</td>
<td>1910(77.02)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Illiterate</td>
<td>5587(52.4)</td>
<td>677(12.12)</td>
<td>4910(87.88)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Primary school</td>
<td>2676(25.10)</td>
<td>551(20.59)</td>
<td>2125(79.41)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary school</td>
<td>1136(10.65)</td>
<td>324(28.5)</td>
<td>812(7148)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diploma</td>
<td>702(6.58)</td>
<td>185(26.35)</td>
<td>517(73.65)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>University</td>
<td>562(5.27)</td>
<td>69(12.28)</td>
<td>493(87.72)</td>
<td></td>
</tr>
<tr>
<td>Use smoke</td>
<td>No</td>
<td>7594(95.41)</td>
<td>366(4.59)</td>
<td>7594(95.41)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>2703(25.35)</td>
<td>1440(53.27)</td>
<td>1263(47.73)</td>
<td></td>
</tr>
<tr>
<td>Use alcohol</td>
<td>No</td>
<td>10095(94.67)</td>
<td>1337(13.24)</td>
<td>8758(86.76)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>568(5.33)</td>
<td>469(16.94)</td>
<td>99(17.43)</td>
<td></td>
</tr>
<tr>
<td>Use hookah</td>
<td>No</td>
<td>10115(94.86)</td>
<td>1468(14.54)</td>
<td>8647(85.49)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>548(5.14)</td>
<td>338(61.68)</td>
<td>210(38.32)</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>Under weight</td>
<td>413(3.88)</td>
<td>189(45.76)</td>
<td>224(54.24)</td>
<td>0.0001</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>3879(36.41)</td>
<td>909(23.43)</td>
<td>2970(76.57)</td>
<td></td>
</tr>
</tbody>
</table>
The mean levels of triglycerides, cholesterol, LDL, and HDL of the individuals were 130.3 ± 80.86, 186.75 ± 41.7, 104.99 ± 27.9, and 47.7 ± 12.8 mg/dL, respectively. Also, a statistically significant difference was seen in the mean levels of HDL (P < 0.001) and cholesterol (P = 0.04) between opium users and non-users (Table 2).

Table 2
Distribution of the mean levels of lipids among opium users and non-users in the population of 40 to 70 years of Kharameh

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Use opium (mean ± SD)</th>
<th>Non-use opium (mean ± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDL</td>
<td>104.99 ± 27.9</td>
<td>104.13 ± 28.03</td>
<td>105.31 ± 27.96</td>
<td>0.15</td>
</tr>
<tr>
<td>HDL</td>
<td>47.7 ± 12.8</td>
<td>45.99 ± 12.15</td>
<td>48.07 ± 12.64</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>TG</td>
<td>130.3 ± 80.86</td>
<td>132.22 ± 87.07</td>
<td>129.99 ± 79.53</td>
<td>0.28</td>
</tr>
<tr>
<td>CHOL</td>
<td>186.75 ± 41.7</td>
<td>184.98 ± 41.84</td>
<td>187.11 ± 41.75</td>
<td>0.04</td>
</tr>
</tbody>
</table>

LDL: Low density lipid, HDL: High density lipid, TG: Triglyceride, CHOL: cholesterol

About 15.06%, 20.3%, 12.81%, and 25.18% of opium users had abnormal levels of triglyceride, cholesterol, LDL, and HDL levels, respectively. Also, 13.34%, 13.94%, 3.72%, and 5.38% had unhealthy levels of triglyceride, cholesterol, LDL, and HDL levels, respectively (Fig. 1).

The results of the correlation analysis showed that age (r=-0.02, P = 0.029), BMI (r = 0.0119, P = 0.0001) and physical activity level (r=-0.45, P = 0.0001) had a statistically significant correlation with triglyceride level. BMI (r=-0.06, P = 0.0001) and physical activity level (r=-0.02, P = 0.0024) had a statistically significant correlation with cholesterol levels but age did not show a significant correlation (P = 0.058) with cholesterol level. LDL level also showed a statistically significant correlation with BMI (r = 0.06, P = 0.0001) and physical activity level (r=-0.034, P = 0.003), but it did not show a significant correlation with age (P = 0.059). Age (r = 0.062, P = 0.0001), BMI (r = 0.0619, P = 0.0001), and physical activity level (r=-0.017, P = 0.0001) had a statistically significant correlation with HDL level.

The results of linear regression analysis also showed that alcohol consumption (β = 12.2, P = 0.001), and individuals with normal BMI (β = 15.9, P = 0.0001), overweight (β = 29.4, P = 0.0001), and obesity (β = 36.5, P = 0.0001), and residents of the urban (β = 8.1, P = 0.0001) had a significant relationship with high...
triglyceride levels. Also, not having a job ($\beta = -4.4$, $P = 0.015$), age ($\beta = -0.25$, $P = 0.008$), the individuals with level of moderate of SES ($\beta = -4.7$, $P = 0.03$), the individuals with level of severe of physical activity ($\beta = -8.7$, $P = 0.001$) and smoking ($\beta = -7.16$, $P = 0.001$) had a statistically significant relationship with the lower level of triglycerides (Fig. 2(A)).

age ($\beta = -0.14$, $P = 0.004$), individuals with normal BMI ($\beta = 6.27$, $P = 0.004$), overweight ($\beta = 9.5$, $P = 0.0001$), and obesity ($\beta = 10.5$, $P = 0.0001$), individuals with level of education of diploma ($\beta = -2.92$, $P = 0.003$) and university ($\beta = -2.98$, $P = 0.03$), and alcohol consumption ($\beta = 5.67$, $P = 0.004$) showed a statistically significant relationship with cholesterol level (Fig. 2(B)).

individuals with normal BMI ($\beta = 5.26$, $P = 0.0001$), overweight ($\beta = 7.44$, $P = 0.0001$), and obesity ($\beta = 7.94$, $P = 0.0001$), and residents of the urban ($\beta = 7.7$, $P = 0.0001$) and age ($\beta = -0.07$, $P = 0.025$) had a statistically significant relationship with LDL (Fig. 2(C)). Also, individuals with normal BMI ($\beta = 5.55$, $P = 0.0001$), overweight ($\beta = 7.88$, $P = 0.0001$), and obesity ($\beta = 8.3$, $P = 0.0001$), and residents of the urban ($\beta = 8.2$, $P = 0.0001$), alcohol use ($\beta = 2.82$, $P = 0.03$), age ($\beta = -0.08$, $P = 0.013$), individuals with level of education of university ($\beta = -2.39$, $P = 0.012$), diploma ($\beta = -2.1$, $P = 0.002$) and secondary ($\beta = -3.84$, $P = 0.0009$) showed a statistically significant relationship with the level of HDL (Fig. 2(D)).

Discussion

Opium abuse is common in West Asia and Iran due to the common beliefs among people about the effects of prevention and treatment of diseases. Also, conflicting results regarding the effects of opium consumption on lipid profiles have been reported. Therefore, in this cross-sectional study with a large sample size obtained from detailed cohort data, we examined the relationship between opium and lipid profile.

The findings of our study showed that the prevalence of opium use is 16%, which is more than the study of Fallahzadeh et al. (19) and in line with the results of the cohort studies conducted in the north (10) and lower than south of Iran (20).

In a study conducted in India, the prevalence of opium use in men was 5.76%, which was lower compared to our results (21). One of the reasons for the high prevalence of drug use in different parts of Iran and in this study can be attributed to its neighborhood with Afghanistan and the fact that Khareeh is on the way to transport opium into the country from the eastern and southern borders. Therefore, people have more access to this type of substance (9), and it may also be due to the belief that opium use has a preventive role in disease control (22). In our study, the prevalence of smoking (25.3%) was almost twice the average in Iran, so that in the meta-analysis study, Mooszadeh et al. estimated the prevalence to be 13.9% (23). In this study, the prevalence of smoking was higher than in the countries of Pakistan (19.4%), Oman (7%), Kuwait (17%), Saudi Arabia (11.6%), and America (20.6%), and was in line with the results of the study conducted in Italy (26.2%) (24–29).
Alcohol consumption in the population under study is nearly one-third that of Iran. In the meta-analysis study conducted by Chegni et al., the prevalence of alcohol consumption in Iran was reported at 13% (30). In a study conducted in India, the prevalence of alcohol consumption in men was reported to be 35% (31), which is high compared to our study. The low prevalence of alcohol consumption in our study could be due to the following reasons: First, due to religious beliefs, Iranian society consumes less alcohol than some other countries; second, alcohol consumption is a crime in Iran, both because of the crime it is and because of the social stigma it carries.

Previous studies have shown that cholesterol levels in opium users are lower than those of normal people. Fatemi et al. showed in their study that the cholesterol level of opium addicts with a BMI between 18 and 25 was 20 mg lower than that of healthy people (12). In our study, cholesterol was lower in opium users than in healthy people. In line with our study, in a meta-analysis study that was conducted on the lipid profile of diabetic patients, it has been shown that opium use reduces cholesterol levels (32). However, in the following studies, no significant results have been obtained regarding the relationship between opium and reducing cholesterol levels. In Hosseini et al.’s study, they showed weak evidence of the relationship (33), and in Rezvanfar et al.’s study, although cholesterol levels were lower in opium users, the results were not significant (34). In these studies, although the cholesterol levels were lower in the consumer group, the results were not significant, which may be due to the small sample size in these studies.

The findings of our study showed that the consumption of opium has a negative effect on HDL levels and that it decreases with alcohol. In line with our study, in the study of Asadi Karam et al., they have shown that HDL levels in opium users are lower than healthy people (35). However, some studies have shown that opium consumption has no significant effect on HDL (32–34).

The results of our study showed that opium is not related to LDL or triglycerides, which is in line with the results of other studies (12, 36, 37), but in some studies it has been shown that triglycerides are lower in opium users (33, 34). On the other hand, Rahimi et al. reported weak evidence of the effect of opium on lowering LDL levels in their study (38). In general, low levels of some lipids in people who use opium may be due to malnutrition associated with a loss of appetite in these people. In studies, it has been shown that drug abuse significantly changes the diet and addicts have a poor nutritional status, and it has also been shown that the weight of addicts is lower than the average weight of the population in terms of gender and height (39). In our study, there was a significant difference in BMI between opium users and healthy people, which can be high for the mentioned reason.

Some of the findings in our study, as well as other studies, may suggest anti-lipid effects of opium, but they should be interpreted with caution because many factors other than opium use can affect lipid profiles, which may be different between addicts and non-addicts, and it is difficult to control them in a cross-sectional study. The results of the multivariate analysis of our study showed that alcohol consumption and high BMI increase the level of triglycerides, while not having a job, old age, and university education decrease it. In other studies, the role of ethanol in increasing triglyceride levels has
been mentioned, so that in a clinical trial study that was conducted on healthy people and people with hypertriglyceridemia, it was shown that people who drank moderate amounts of ethanol three times a day, saw their plasma triglyceride levels increase significantly (40), which is in line with the results of our study. It has been mentioned in other studies that alcohol increases triglyceride levels (20, 41). Previous studies in line with this study have shown that triglycerides are significantly higher in obese people (20, 42). In our study, age was shown as a protective factor for triglyceride levels, in contrast to other studies, which have shown that age plays a role as a risk factor and causes an increase in triglyceride levels (43, 44). However, in a cohort study conducted for 15 years on people over 70 years old in Finland, no significant relationship between age and triglycerides was observed (45). One of the reasons for observing the inverse relationship between age and triglyceride levels in our study may be because with increasing age, the incidence of non-communicable diseases, especially cardiovascular (48, 49), and hyperlipidemia (50), increases, which causes people to change their lifestyle or take triglyceride-lowering drugs. Therefore, the correlations obtained in cross-sectional studies should be interpreted with caution.

The results of multivariate analysis also showed that age, body mass index, diploma and university levels of education, and alcohol consumption increase cholesterol levels. Studies have shown conflicting results regarding the relationship between age and cholesterol. Age raises cholesterol in some studies (21), but lowers it in others (51–53). In some studies, age increases cholesterol (20) and in others it decreases (46–48). In these studies, it has been shown that cholesterol increases in men up to the age of 65 and in women up to the age of 75 and then decreases (47, 49, 50). The difference observed among the studies may be due to the fact that the age range studied in each study is different from the other because, according to the studies, cholesterol in the elderly decreases with increasing age and increases in the middle-aged with increasing age, as mentioned above, and in our study, most of the people were middle-aged. Previous studies have also shown that alcohol consumption increases cholesterol levels (51, 52), which is consistent with the findings of our study.

**Conclusion**

Contrary to the beliefs that there are about the effects of opium on reducing lipid profile levels, in our study, there was no correlation between LDL, triglycerides and opium consumption. The levels of HDL (good cholesterol that prevents heart attacks) were lower in addicted people than in healthy people. Although in this study the level of cholesterol was lower in addicts, in general, due to the known side effects of opium on non-communicable diseases, especially cancers, the use of opium is not recommended to reduce lipid profile.

**Methods**

The current study is a cross-sectional study that was conducted using the data of the Kharameh cohort study in southern Iran with the aim of determining the status of the lipid profile in opium users. In this study, 10,663 individuals aged 40 to 70 years have been examined. The Kharameh cohort study is a part of the large Prospective Epidemiological Research Studies in Iran (PERSIAN) that is being conducted in
18 regions of Iran. The inclusion criteria in this study include: age between 40 and 70 years, living in Kharameh city for at least 9 months, and having Iranian nationality. Exclusion criteria include mental disorders and mental retardation. Unwillingness to participate in the study and not attending the designated clinics for physical examinations is another exclusion criterion.

In the Kharameh cohort study, all demographic information was collected by trained experts during face-to-face interviews. Also, clinical information was checked by trained doctors and recorded in electronic questionnaires. To collect the information of the participants, questionnaires related to the study of the PERSIAN cohort, which were previously validated, were used. To conduct the present study, information related to demographic characteristics such as age, sex, education level, socioeconomic status (SES), marital status, and body mass index (BMI) was used, as well as behavioral habits such as smoking, drinking, and using hookahs or opium. The SES was calculated using the variables related to an individual's property and the principal component analysis (PCA) method. To check the physical activity status of the individuals, the metabolic equivalent of task (MET) index was calculated. This index shows the ratio of the individual's physical activity metabolism rate to the individual's metabolism rate while sitting and resting (53). Therefore, a calorie is equal to one kilocalorie of energy consumed per kilogram of body weight at rest (54). History of smoking, opium, and alcohol usage was recorded. The participants were asked if they are active current smoker, or use opium derived products or alcohol frequently during a week.

To check the levels of low-density lipoprotein (LDL), high-density lipoprotein (HDL), triglycerides, and cholesterol of the individuals, their blood samples, which were collected at the beginning of the Kharameh cohort study, were used. For blood sampling, individuals were advised to refrain from strenuous physical activity for three days before and also to refrain from eating and drinking (except water), smoking, and alcohol consumption for 12 hours before. LDL, HDL, triglyceride, and cholesterol tests were done by the Mindray BS-380 machine, made in Japan, and using the Pars kit. Triglycerides above 150 mg/dL are considered high and abnormal triglycerides, and total cholesterol above 200 mg/dL is considered high cholesterol. Furthermore, LDL levels greater than 130 mg/dL are considered high, while HDL levels less than 40 for men and less than 50 for women are considered low HDL (20, 55).

**Statistical analysis:**

Quantitative data were described with mean and standard deviation, and qualitative data with the frequency and percentage. A chi-square statistical test and Fisher's exact test were performed to evaluate the difference between the levels of qualitative variables, and a t-test was also performed to evaluate the difference between the lipid profile levels between opium users and non-users. After checking the normality of quantitative variables with the Kolmogorov-Smirnov statistical test, we used Pearson's correlation coefficient to check the correlation between the lipid profile of individuals with quantitative variables. We also used simple and multiple linear regression to identify the factors related to the increase or decrease in the lipid profile levels of individuals. All the variables with a p value less than 0.2
in simple linear regression were entered into multiple regressions. The significance level for all tests was considered less than 0.05, and all analyses were performed in STATA version 12 software.

**Declarations**

**Ethics approval and consent to participate**

PERSIAN Cohort Study is being performed in 18 geographical regions of Iran. PERSIAN Cohort Study was approved by the ethics committees of the Ministry of Health and Medical Education Shiraz is one of the regions. This study is in agreement with the Helsinki declaration and Iranian national guidelines for ethics in research. (Reference number: IR.SUMS.REC.1400.612), and informed written consent was obtained from all participants.

**Consent for publication**

Written informed consent for publication was obtained from each participant.

**Competing interests**

The authors declare that there is no conflict of interest.

**Funding**

This research received no external funding.

**Authors’ contributions**

NB, and MGH did the research, wrote the manuscript, and contributed to data collection. AR and VH critically reviewed the manuscript and approved the final version. LM and FJ did the research, analyzed the data, and critically reviewed and edited the manuscript. All authors have read and approved the manuscript.

**Availability of data and materials**

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

**References**


**Figures**

<table>
<thead>
<tr>
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<th>Normal</th>
<th>Healthy Borderline</th>
<th>Abnormal</th>
<th>Unhealthy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol non-opium</td>
<td>35.31</td>
<td>30.15</td>
<td>20.38</td>
<td>14.16</td>
</tr>
<tr>
<td>Cholesterol in use-opium</td>
<td>35.69</td>
<td>30.06</td>
<td>20.3</td>
<td>13.94</td>
</tr>
<tr>
<td>Triglyceride non-opium</td>
<td>40.67</td>
<td>30.99</td>
<td>15.86</td>
<td>12.47</td>
</tr>
<tr>
<td>Triglyceride in use-opium</td>
<td>39.53</td>
<td>32.06</td>
<td>15.06</td>
<td>13.34</td>
</tr>
<tr>
<td>LDL in non-opium</td>
<td>45.27</td>
<td>37.23</td>
<td>13.99</td>
<td>3.51</td>
</tr>
<tr>
<td>LDL in use-opium</td>
<td>47.31</td>
<td>36.16</td>
<td>12.81</td>
<td>3.72</td>
</tr>
<tr>
<td>HDL in non-opium</td>
<td>40.67</td>
<td>33.13</td>
<td>22.27</td>
<td>3.91</td>
</tr>
<tr>
<td>HDL in use-opium</td>
<td>33.22</td>
<td>36.22</td>
<td>25.18</td>
<td>5.38</td>
</tr>
</tbody>
</table>
Figure 1

- Normal range: cholesterol <170, triglyceride <100, LDL <100, HDL >50
- Healthy as normal borderline: cholesterol 170-200, triglyceride 100-150, LDL 100-130, HDL 40-50
- Abnormal borderline: cholesterol 200-230, triglyceride 150-200, LDL 130-160, HDL 30-40
- Unhealthy: >230, triglyceride >200, LDL >160, HDL <30

Prevalence of different lipid profile levels in opium users and non-users in the population of 40 to 70 years of Kharameh

Figure 2

(A): Predictors of TG level based on the results of multiple linear regression in the population of 40 to 70 years of Kharameh

(B): Predictors of Chol level based on the results of multiple linear regression in the population of 40 to 70 years of Kharameh
(C): Predictors of LDL level based on the results of multiple linear regression in the population of 40 to 70 years of Kharameh

(D): Predictors of HDL level based on the results of multiple linear regression in the population of 40 to 70 years of Kharameh