Level of Education and Coffee Consumption in a Group of Industrial Employees a preliminary report

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Abstract

We have conducted a study in a group of industrial employees, in order to evaluate if coffee consumption is related to the education level. 25 persons with high education and 50 persons with low education (unskilled work force) were included. The groups were similar in gender and age distribution. We have recorded daily consumption during the annual health check up, using a standard questionnaire. Excel Stat Plus 2013 was used for performing the statistical analysis. A significant, higher intake of coffee cups was recorded in the unskilled group; the estimated average caffeine intake was 428 mg/day. This group had also a higher smoking prevalence. The study confirmed that caffeine intake varies across occupational groups, according to education level. The health promotion activities related to coffee drinking should particularly target this population and adapt its instruments to influence the excessive consumption.

Introduction

Although coffee is one of the most popular beverages worldwide, the is still a scientific debate if this is a positive or a negative habit. Recent studies emphasized the positive effects of coffee consumption as antioxidant [1] they also found significant reduction in risk of neurodegenerative diseases, as Alzheimer [2,3] or Parkinson’s disease [4], of hepatic cancer and chirrhosis [5,6], of cardio-vascular and metabolic syndrome [7,8]. Improvement of neuro-cognitive and physical performances are common perceptions about benefits associated with caffeine intake [9,10] but controversies persist in a conclusive demonstration of these effects. The negative effects such as, dependence, nervousness and sleep disorders [11], cholesterol increase [12], ischemic heart disease, arrhythmia [13] and hypertension are related the excessive consumption. Most of the coffee negative health effects are attributed to caffeine. Although there is no current consensus about the threshold of “excessive caffeine consumption”, up to 400 mg/day appears to be safe for most healthy individuals [14]. Caffeine consumption is popular in Romania, particularly as coffee, and has an important social conditioning; “having a coffee together” is a frame for inter-human communication, a basic need for group activities, including the occupational teams.

Socio-economic stratification of consumption has been reported in other national surveys, but there are few studies that looed inside companies for the consumption patterns of the different categories of employees. This evaluation is important from the desinging of the work promotion activities of the occupational health service. As part of the annual mandatory medical evaluation, we have conducted a study in a group of industrial employees, in order to evaluate coffee consumption related to the education level.

Methods

Data collection was accomplished in february 2016. We included in the study 25 persons with high education (engineers, economists, managers, marketing and human resources specialists) and 50 persons with low education (unskilled work force), the first that have been scheduled by their employers for the annual check up who have declared consuming at least 1 cup of coffee/day. All subjects were employed in industrial companies from the region. We assigned them in 2 groups: the ones with low education was included in group 1, and the ones with high education in group 2.

Data were collected by the occupational physician, during the annual medical visit. A standard questionnaire have been used to record number of coffee cups/day, number of cofee cups during the working shift, and number of cigarettes smoked on average during the coffee break. The content of caffeine was estimated to 100 mg/cup, as the common consumption in this workplace was from the commercial coffee machines.

Data related to age, sex and level of education were extracted from the medical records. Statistical analysis (Chi-square test) was performed using the Excel Stat Plus 2013.

Results

Gender distribution is presented in Table 1. There were more men than women, in both groups, but there was no statistical difference in the gender distribution (c² = 0.44642 P>0.05).

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Table 1: Distribution by gender

| Gender | group 1 | group 2 | Total |
|--------|---------|---------|-------|
| women  | 14%     | 20%     | 34%   |
| men    | 86%     | 80%     | 166%  |

The age distribution is presented in Fig 1 and 2. It was also similar in the two groups ($c^2 = 0.3284$ P>0.05).

Coffee consumption: The average consumption in group 1 was 4.28 ± 2.24 coffee cups/day, while the average was 2.12 ± 1.61 coffee cups/day in group 2. The median value was 4 in group 1, and had a value of 1 in the group 2. The maximum number of coffee cups in group 1 was 10 cups/day and 6 cups/day in group 2. The quantitative pattern of coffee cups consumption was different between the two groups ($c^2 = 20.6538$; P<0.01).

When asked about the coffee cup dimension, 86.5% of all subjects indicated the 150 ml cups of the commercial coffee machines.

90% of the group 1 and 63% of the employees in group 2 were smokers and all of them declared smoking while drinking coffee. Average number of cigarettes/ coffee cup was 2 in both groups.

**Discussions**

The average consumption in our study was 428 mg/day in the low education group, and 212 mg/day for the subjects with higher level of education. In the high education group, the maximum number of coffee cups/day was 6; in the low education group the maximum number was 10. The differences in coffee cups consumption according to education level were statistically significant (p<0.001).

This consumption is higher than recommended in the lower level education group [14,15] and is moderate for the high education group. The quantity of caffeine level could be, in fact, higher as we haven't included in the questionnaire other beverages with caffeine content. Comparing to the general population in US, our average is almost 4 times bigger in the low educational level [16] but similar with the one previously reported in laborers [17].

Coffee is a popular beverage in Romanian population. It is perceived by the general population as safe; therefore our data, based on employees declaration, are generally more accurate than those related to cigarette consumption, particularly if data are recorded during the occupational health check up.

68% of Romanians declare daily consumption of coffee [18], but specific behaviour according to the level of education or to the socio-economic status has not been investigated. In other European countries, national surveys recorded controversial data about this topic: in the Dutch National Food Consumption Survey [19], consumption was higher in the low socio-economic group, while in a German national survey [20] consumption was higher in the high socio-economic group.

There are few studies conducted in workplaces specifically aiming coffee consumption evaluation. Most of these studies have focused on the increased consumption related to night shifts or long working hours in nurses or truck drivers. In the healthcare services, a recent study showed the propensity of buying coffee to be increased with hierarchical position ($c^2 = 556.24$; P<0.01), with heads of departments buying more rounds than junior doctors (30% v 15%) [21]. In army soldiers, the average intake was lower than the level we have observed in the unskilled workers (303 mg/day in men and 163mg/day in women) [22].

The association of excessive coffee intake with other unhealthy behaviours have been reported. A study published by Alcoholics Anonymous in US [15] reported that more than one third of alcoholics drink more than > 4 coffee cups/day and more than 78.7% are current or former smokers, of which 60% are highly...
dependent. We haven’t checked the alcohol consumption, as it is frequently under reported during the occupational medicine consultation. Smoking was frequent in our population and had a higher prevalence in the low education group. As all subjects declared smoking while drinking coffee, we concluded that coffee drinking supports the smoking habit and a smoking cessation intervention in this population should also address the coffee drinking habit.

Unskilled workers take breaks for coffee consumption, while office workers have their coffee at their desk and work in the same time. From the working performance point of view, this is another negative effect of coffee consumption by low level education workers.

This is a preliminary report that has identified an important issue in the industrial workforce served by the occupational medicine clinic. In order to better understand the impact of this habit, an extension of the questionnaire both on the motivation of this behaviour and on the identification of other lifestyle elements (smoking, physical activity, drinking, nutrition habits) has to be conducted during the next occupational health check up.

**Conclusion**

There is an increased consumption of coffee in unskilled workers, leading to high caffeine intake. The health promotion activities related to coffee consumption should target this specific population and adapt its instruments to influence it. In order to better understand how to approach increased coffee consumption in a work health promotion program the motivators for this consumption and other lifestyle elements have to be considered.

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