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REVIEW

# Hookah, is it really harmless?



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**Summary**

The hookah is a snuff smoking device whose origin dates back to the fifteenth century, has been used extensively in the Middle East in recent decades has become popular in Western culture countries, particularly in Americas and Europe. It has been reported that like other forms smoking tobacco, their use can lead to addiction also is used for inhaling and other addictive substances. Has also been considered a risk factor for various isolated diseases, including chronic obstructive pulmonary disease (COPD), different types of cancer, hemodynamic alterations, vascular disease, infectious diseases, among others. In pregnant women has been reported that there use condition a diminution on fetal growth and different diseases in the newborn. It was also mentioned that hookah smoke contains several toxic substances that can affect both, the primary and the passive smoker, so we did this review to determine the complications associated with its use.

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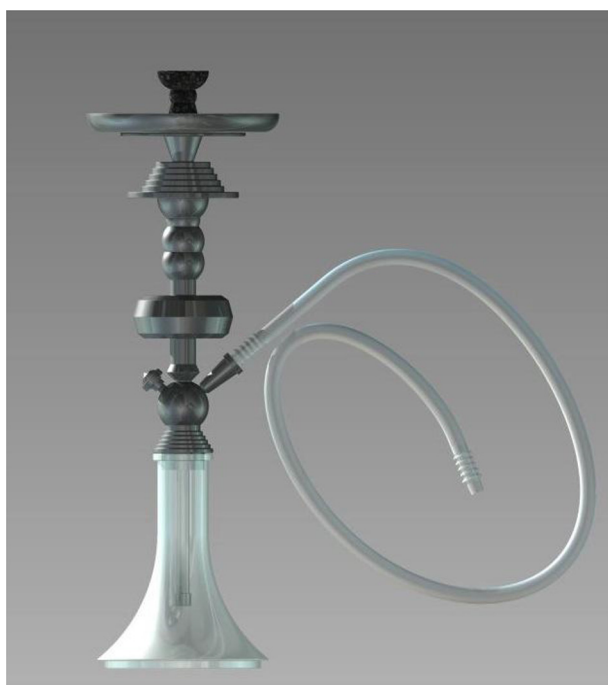
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## Introduction

The hookah (also known as shisha, huqqa, argchile, hookah, hubble, bubble, gozza, water pipe or boori) is a snuff smoking device created in the Indo-Pakistan subcontinent in the XV century [1] (Fig. 1). Its use represents a tradition that seeks to community interaction, although it was considered a pleasure for Rajas (Hindus rulers) [2]. In the XVI century its use spread to the Ottoman Empire, followed by Egypt and other regions of Mediterranean [1].

The hookah has been widely used in the Middle East, in recent decades, its use has gradually increased in young people lives in countries with Western culture, particularly in Americas and Europe [1,3], it is estimated that 100 million people around the world smoke hookah every day [4].

Recent publications show that unlike cigarette, the hookah is more socially accepted and for that reason fewer awareness campaigns with the objective to informs the public about the addictive and harmful to health exist [4,5], which is because the hookah use among young people, mainly women, has increased substantially in recent years. Furthermore it has been seen that users hookah tend to became cigarette smokers [5–8].



**Figure 1** Graphical representation of the hookah.

The World Health Organization has reported that hookah smoke inhaled per puff is 0.15–1 lt and average hookah session lasts 20–80 min, this is equivalent of smoking 100 cigarettes or more [9]; currently there are sources available online that allow us to calculate this equivalence [10].

The aim of this review is to present the most important complications and associations of the use of hookah, from a critical and clinical perspective.

## Addiction

Unlike the cigarette, the hookah has been less studied in relation to its addictive properties. Despite this, it is clear that individuals who use it are susceptible to suffer from addiction; this is due to the chemical properties of the smoke, duration and frequency of use, type of tobacco used and the volume of smoke inhaled.

Maziak published that hookah is an efficient tool that allows the user to dispose addictive and pathogenic substances contained in hookah smoke such as nicotine carbon monoxide [11], formaldehyde, acetaldehyde, acrolein among others [12,13]. Neergaard et al. published a meta-analysis which estimated that nicotine levels in the 24 h urine recollection in individuals who smoke hookah daily are 0.785  $\mu\text{g}/\text{ml}$  (95% CI 0.578–0.991), the equivalent of 10 cigarettes (95% CI 7–13) [14] sufficient to develop an addiction [11].

Some teenagers start smoking hookah because it gives them a sense of belonging, maturity and autonomy, because this practice is usually performed as a group, today some groups use the hookah to use other addictive substances like marijuana or alcohol, when they replace the water or add this last one to the hookah container [15].

Smith-Simone showed that much of hookah smokers (HS) have the false belief that the use of it does not generate addiction, analyzing 100 HS from which 96% believe they have the ability to leave it when they decide but only 32% have tried [16]. Also, there is the mistaken belief that the use of the hookah is free of adverse health effects or have fewer adverse effects than cigarettes, this may contribute to the onset of smoking and lack of interest on leave; for this reason the clinical approach for the addiction of this group of patients should include an integral approach that considers the misperceptions of this practice [17–20].

## Hookah and the lungs

It has been shown that there is a significant difference between HS and no hookah smokers ( $p < 0.001$ ), in relation to the free radical levels in neutrophils fiend peripheral blood samples, being elevated in HS, this conditions a

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