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Research Article

## Comparison of Quality of Life Scores between Cigarette and Hookah Smokers: Findings from Isfahan Healthy Heart Program (IHHP)

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### Abstract

**Objectives:** This study aimed to compare the quality of life (QOL) among cigarette vs hookah smokers and define its socio-economic determinants.

**Methods:** A total of 5830 subjects were included in this study as part of the Isfahan Healthy Heart Program (IHHP). Socio-demographic and smoking habits were recorded. Anyone smoking at least one cigarette per day or hookah at least once per week was regarded cigarette or hookah smoker, respectively. Data entry was performed using SPSS (SPSS Inc. Chicago IL) software version 13.0. Chi-square, t-test, Man-Whitney test and ANOVA were used to compare variables as appropriate.

**Results:** After adjustment for sociodemographic characteristics, hookah smoking was associated with lower odds for total (OR:0.98;95%CI:0.97-0.99), physical (OR: 0.96;95%CI:0.94-0.98) and psychological (OR:0.93;95%CI:0.91-0.95) domains of QOL scores relative to never smokers, even lower than corresponding figures for cigarette smokers.

**Conclusion:** Contrary to popular belief that hookah smoking is considered a hobby, hookah smoking is associated with lower quality of life scores, even more than cigarette smokers. This necessitates more attention by health professionals regarding providing advice and support for hookah smokers. Improved quality of life can be highlighted as a benefit of smoking cessation for hookah smokers.

### Introduction

Hookah smoking is becoming increasingly popular in many countries, both in developed and developing countries, as a recent systematic review showed the prevalence of hookah smoking ranging from 5% to 33%, with the highest prevalence among youth [1]. A study on patients with acute coronary syndrome showed that 38% of patients were smoker, with 1.4% hookah smoker and 3% smoking both cigarettes and hookah [2].

Waterpipe consists of head, body, a water bowl, and hose. The tobacco is held by the head part. The smoke passes through

water and is inhaled. This has led to the popular belief that the toxins are absorbed in the water. Hookah smoking is usually considered as a social hobby and served in gatherings and parties [3-5], especially popular among youth and females, in whom smoking cigarettes is socially disfavored [1,6-8]. However, many studies have shown hookah smoking is associated with short-term and long-term health complications such as coronary heart disease [9-13].

Different studies have reported different prevalence for hookah smoking based on the studied population. Findings of a population-based Iranian study in 2001 showed that prevalence of smoking hookah is 1.0% in Isfahan, a large city in the

central part of Iran, with 1.6% among men and 0.6% among women [14]. Another study in Southern Iran where hookah smoking is more prevalent showed a prevalence of 8% among pregnant women, with 3.2% smoking less than once per day and 4.8% were daily hookah smokers [15].

A previous study in Iran showed that quality of life is lower among tobacco smokers relative to general population [16]. While hookah smoking is increasingly considered a popular pastime and a hobby even accepted socially for women and youth, less research has been performed on the quality of life in hookah smokers. This study aims to investigate whether quality of life (QOL) differs between cigarette and hookah smokers in a sample of Iranian adult population as part of a large community-based study in Iran named Isfahan Healthy Heart Program.

## Methods

This study was performed as part of a community-based study named Isfahan Healthy Heart Program (IHHP). The details of design and methodology have been described elsewhere [17,18]. The study was performed in the central part of Iran in Isfahan and Arak counties as intervention and reference areas, respectively. Starting at 2001, the IHHP lasted for six years, until 2007. A total of 5830 subjects were included in this study from 2003 to 2004. Participants gave written informed consent before entering the study.

Sociodemographic characteristics including age, sex, education (0-12, >12 years), occupation (housewife, retired/unemployed, non-manual, manual) and income (tertiles of low, middle and high) were recorded. Smoking status was recorded by asking patients "are you smoking at present?" yes/no; "which type of tobacco products do you smoke?" Cigarettes/ hookah/ else. Anyone smoking at least one cigarette per day or hookah at least once per week at the time of the study was regarded as cigarette or hookah smoker, respectively and otherwise as nonsmoker.

Quality of life was evaluated with world health organization quality of life questionnaire (WHOQOL-BREF). This is a multilingual, multicultural questionnaire with good to excellent psychometric properties of reliability. It is composed of 26 questions, rated on a 5-point Likert scale, in four domains of physical health, psychological health, social relations and environmental issues. It also reports total quality of life. Higher score indicates better quality of life [19]. The questionnaire also showed good properties in a sample of smokers [20]. The Persian version of the questionnaire was used. It has been previously translated to Farsi and its reliability and validity determined (Cronbach's alpha and intra-class correlation > 0.7, except for social relationships with  $\alpha = 0.55$ ) [21]. All patients gave informed consent before entering the study. The study

was approved by the ethical committee of Isfahan University of Medical Sciences.

## Statistical analysis

To compare quantitative sociodemographic characteristics, one-way ANOVA was used. Chi-square was used to compare qualitative sociodemographic variables such as sex and marital status. Kruskal-wallis test was used for ordinal sociodemographic variables (education and income). To compare domains and total quality of life scores between smokers and non-smokers, t-test, Man-Whitney test and ANOVA were used as appropriate.

Multiple logistic regressions was performed to examine the association of smoking status with the total and four QOL domains, before and after controlling for sociodemographic characteristics, including age, sex, marital status, education, occupation and income.

Data entry was performed using EPI(2000) software and data analysis was performed using SPSS (SPSS Inc. Chicago IL) software version 15.0.

## Results

The study included 903 smokers that 94.4% and 5.6% of them were cigarette and hookah smokers, respectively. Demographic and socioeconomic characteristics of the study population are shown in Table 1.

**Table 1.** Sociodemographic characteristics of the study population according to cigarette and hookah smoking.

	Cigarette smoker (n=852)	Hookah smoker (n=51)	p
Age (mean±SD)	41.21±13.87	39.39±17.35	.467
Sex (%)			.0001
Female	9.3	33.3	
Male	90.7	66.7	
Marital status (%)			.0001
Married	86.3	66.7	
Single	13.7	33.3	
Education (%)			.009
0-12yr	92.7	80.9	
>12 yr	7.3	19.1	
Income (%)			.238
Low	24.8	15.7	
Middle	49.9	51.0	
High	25.3	33.3	
Occupation (%)			.0001
Housewife	8.8	27.5	
Retired/unemployed	13.8	25.5	
Manual	53.6	23.5	
Non-manual	23.8	23.5	
Total QOL (mean±SD)	82.79±11.01	80.50±13.28	.245
Physical domain	25.72±4.21	25.00±4.82	.073
Psychological domain	20.34±3.55	19.11±4.68	.004
Social domain	10.91±2.19	9.98±2.38	.435
Environmental domain	25.81±4.07	26.41±5.29	.159

**Table 2.** Quality of life scores among cigarette and hookah smokers according to sociodemographic characteristics

		Physical domain		Psychological domain		Social domain		Environmental domain		Total QOL	
		Mean ±SD	p	Mean ±SD	p	Mean ±SD	p	Mean ±SD	p	Mean ±SD	p
<b>Cigarette smoker</b>											
Sex	Female	24.82±4.02	.04	20.25±4.18	.82	10.87±2.25	.89	26.75±3.89	.03	82.70±11.38	.95
	Male	25.80±4.23		20.34±3.49		10.90±2.19		25.72±4.07		82.78±10.99	
Marital	Married	25.64±4.13	.30	20.49±3.39	.00	11.30±1.93	.00	25.79±3.98	.67	83.24±10.70	.00
	Single	26.12±4.73		19.35±4.33		8.37±2.10		25.96±4.59		79.82±12.49	
Education	0-12years	25.60±4.22	.01	20.29±3.57	.17	10.89±2.18	.45	25.72±4.06	.02	82.52±11.01	.01
	>12 years	26.98±4.02		20.93±3.34		11.11±2.38		26.95±4.05		85.98±10.82	
job	Housewife	22.21±4.17	.05	17.28±4.21	.46	10.57±2.20	.26	25.57±4.18	.25	75.64±10.98	.29
	Retired	25.92±5.15		20.46±5.60		9.00±2.48		29.07±5.75		84.46±16.29	
	Manual	25.08±4.64		19.16±4.50		10.25±2.22		24.41±5.80		78.91±11.69	
	Non-manual	27.16±4.30		19.75±4.15		10.08±2.60		26.50±4.83		83.50±13.13	
income	Low	24.36±4.21	.00	19.57±3.25	.00	10.62±2.13	.02	24.35±4.05	.00	78.91±10.22	.00
	Middle	25.75±4.29		20.25±3.67		10.91±2.22		25.65±3.94		82.57±11.11	
	High	26.99±3.63		21.26±3.41		11.20±2.16		27.57±3.69		87.02±10.08	
<b>Hookah smoker</b>											
Sex	female	23.35±5.06	.05	17.70±4.71	.17	9.94±2.79	.64	26.58±4.52	.93	77.58±13.77	.19
	male	25.82±4.54		19.82±4.57		10.00±2.20		26.32±5.70		81.97±12.99	
Marital	married	24.02±4.54	.08	18.70±4.23	.34	10.85±1.72	.00	25.50±5.13	.09	79.08±11.96	.21
	single	26.94±4.90		19.94±5.52		8.23±2.61		28.23±5.29		83.35±15.60	
Education	0-12years	23.65±4.36	.00	18.18±4.06	.01	10.10±2.14	.34	25.23±4.37	.05	77.18±10.51	.00
	>12 years	29.44±3.77		22.44±5.19		10.77±2.58		29.55±6.28		92.22±14.57	
job	housewife	24.38±3.92	.00	20.00±3.79	.00	10.76±2.19	.00	26.72±3.91	.28	81.87±10.94	.01
	Retired	24.89±5.12		19.08±4.30		10.23±2.39		25.72±3.96		79.94±12.38	
	manual	25.98±3.91		20.57±3.18		11.07±2.09		25.74±4.05		83.37±10.23	
	non manual	26.12±4.24		20.78±3.51		11.05±2.30		25.93±3.99		83.89±11.34	
income	Low	24.25±6.67	.32	20.00±4.56	.80	9.50±1.30	.30	27.37±5.15	.52	81.12±12.32	.79
	Middle	24.30±3.74		19.00±4.77		10.34±2.68		25.30±4.55		78.96±12.11	
	High	26.41±5.29		18.88±4.83		9.64±2.31		27.64±6.28		82.58±15.73	

**Table 3.** Odds ratios (95% CI) for quality of life scores among cigarette and hookah smokers adjusted for sociodemographic characteristics

	Cigarette smoker	Hookah smoker	Never smoker
Physical domain	0.96(0.95-0.98)	0.92(0.86-0.98)	Ref
Psychological domain	0.93which	0.85(0.78-0.92)	Ref
Social domain	0.97(0.93-1.01)	0.90(0.78-1.05)	Ref
Environmental domain	0.97(0.95-0.98)	0.96(0.89-1.03)	Ref
Total	0.98(0.97-0.99)	0.96(0.94-0.98)	Ref

Among hookah smokers 33.3% were female, 19.1% were single and 19.1% had college degree. However, in cigarette smokers 9.3% were female, 13.7% were single and 7.3% had college degree. There was significant difference between cigarette and hookah smokers regarding sex (p=0.001), marital status (p=0.001) and education (p=0.009). Total QOL was 82.79±11.01 and 80.50±13.28 among cigarette and hookah smokers, respectively (p=0.245) (Table 2).

After adjusting for Sociodemographic characteristics, cigarette and hookah smoking were associated with lower odds for quality of life. Hookah smoking was associated with lower odds for physical and psychological domains of QOL (Table 3).

**Discussion**

The findings of this population-based study showed a lower quality of life among hookah smokers relative to cigarette

smokers after adjustment for sociodemographic factors. Hookah smokers had also significantly lower scores in physical and psychological domains of quality of life. Quality of life scores were lower among cigarette versus hookah smokers.

Compared with cigarette smokers, hookah smokers included higher numbers of women and singles and college graduates. This is similar to the findings of other studies in other parts of the world that have shown hookah smoking is more common among youth and women feel more free to smoke hookah than cigarettes [1,22].

QOL showed association with Sociodemographic characteristics. Among hookah smokers, physical domain, psychological domain and total QOL was associated with education and occupation, compared with cigarette smokers that education, marital and income showed association with QOL. Studies in the general population as well as smokers have shown association between sociodemographic factors and quality of life [16,23].

While smoking hookah is a popular pastime, hookah smokers in our study showed lower quality of life scores relative to nonsmokers. A previous study showed that following hookah smoking nicotine and cotinine levels rise to high levels [11]. Another study showed carboxyhemoglobin levels are higher in hookah smokers than cigarette smokers [9]. The effects of nicotine on muscles, cardiovascular system and muscles might explain lower QOL scores in physical domain [13,24]. While hookah smoke mainly constitutes nicotine, it also contains harmful substances such as arsenic, chromium and lead [10]. These might explain lower quality of life in hookah smokers due to the adverse effects of nicotine and other harmful substances in hookah smokers.

While a direct comparison of cigarette and hookah smokers for quality of life scores may not be relevant due to different characteristics and patterns of use, such a comparison may be helpful in clarifying the popular belief about hookah smoking as a hobby and its real effect on feelings of wellbeing. Hookah smokers had even lower scores relative to cigarette smokers in physical and psychological domains. Generally, cigarette smoking is more experienced among lower socioeconomic class [25] and related to stressful conditions [26], people may smoke due to conditions such as pleasure and enjoyment [27]. This may seem reasonable for hookah smokers, as it is considered more as a hobby than a dependency. However, a study showed that hookah smokers may have criteria of dependency [22]. Our findings also showed that quality of life is associated with lower quality of life among hookah smokers even lower than cigarette smokers, though the difference is small.

The findings of this study documented lower quality of life among hookah smokers. This can be of value while recom-

mending hookah smokers to stop smoking considering lower physical and psychological quality of life scores. It also alerts physicians and health care workers that provide smoking cessation consultation to hookah smokers. As their patients may suffer lower quality of life, they need more attention. Moreover, a better quality of life can be mentioned as a benefit of stopping smoking hookah. Improving population knowledge about lower wellbeing among hookah smokers can help keep people especially youth from smoking hookah. This study raised further questions to the nature and effects of hookah smoking, both from smokers' views and the effects it has on body.

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