

EPIDEMIOLOGY OF PEOPLE IN LEBANON COMPARED TO JORDAN: SMOKING HABITS, COFFEE, OCCUPATIONAL EXPOSURE, AND THE EFFECT OF WATERPIPE TOBACCO SMOKING ON BLADDER CANCER AND OTHER CANCERS

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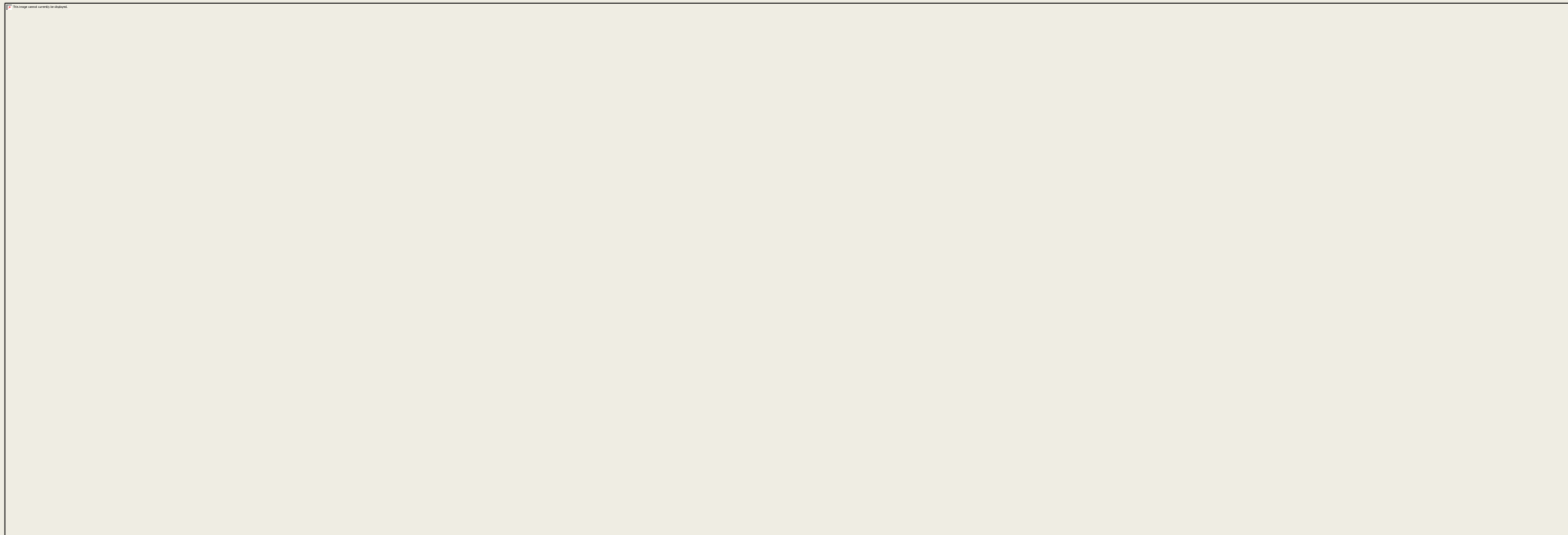
- Waterpipe smoking (WPS, also known as hookah, shisha, nargileh, hubble-bubble) has an estimated prevalence of 100 million worldwide, mostly among adolescents of the Middle East.



Why is it peaking?

- Introduction of flavors
- Socially accepted in cafes and restaurants
- Social media promotion
- False perceptions
- Lack of rules and regulations

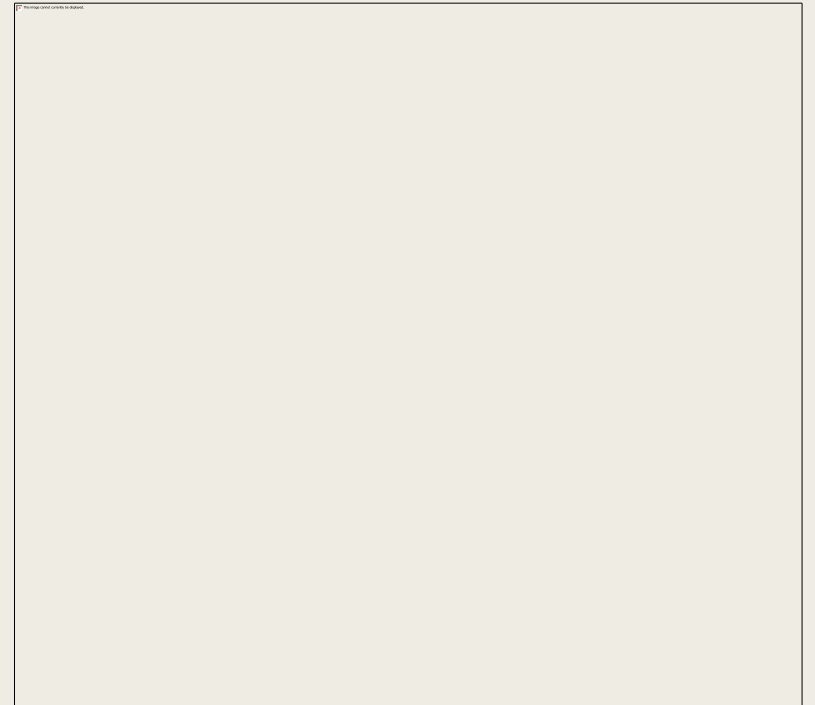
Internet search and WP



Salloum RG, Osman A, Maziak W, Thrasher JF. How popular is waterpipe tobacco smoking? Findings from Internet search queries . Tob Control. 2014 Jul 22. pii: tobaccocontrol-2014-051675. doi: 10.1136/tobaccocontrol-2014-051675.

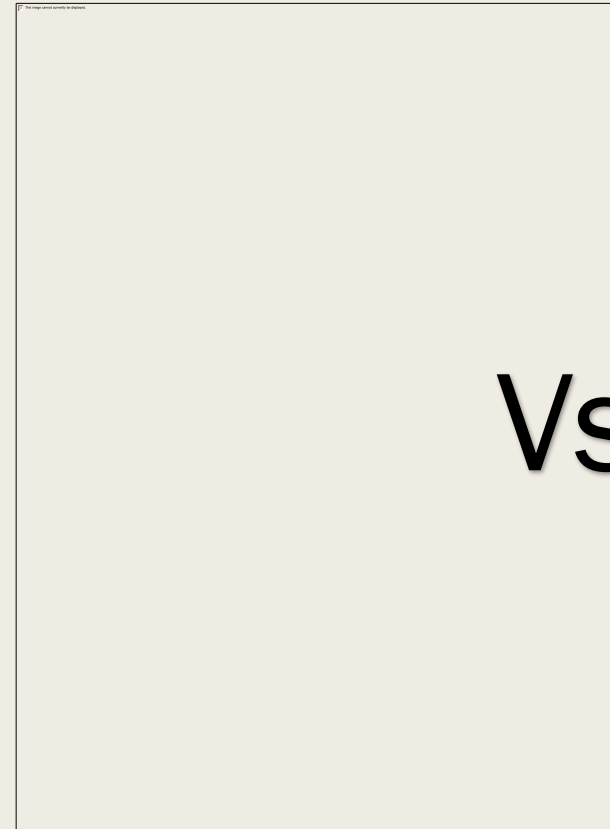
Why is the smoke toxic?

- Carcinogens:
 - *Tobacco-specific nitrosamines*
 - *Polycyclic aromatic hydrocarbons (PAH)*
 - *Volatile aldehydes (formaldehyde)*
 - *Benzene*
- Toxicants:
 - *Nitric oxide*
 - *Heavy metals*
 - *CO and carcinogenic PAH from charcoal*

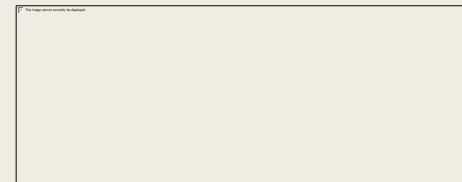


Carcinogen levels in blood and urine samples compared to cigarette smokers

- Greater exposure to:
 - *CO*
 - *PAH*
- Lower exposure to:
 - *Tobacco-specific nitrosamines*
- Similar exposure to:
 - *nicotine*

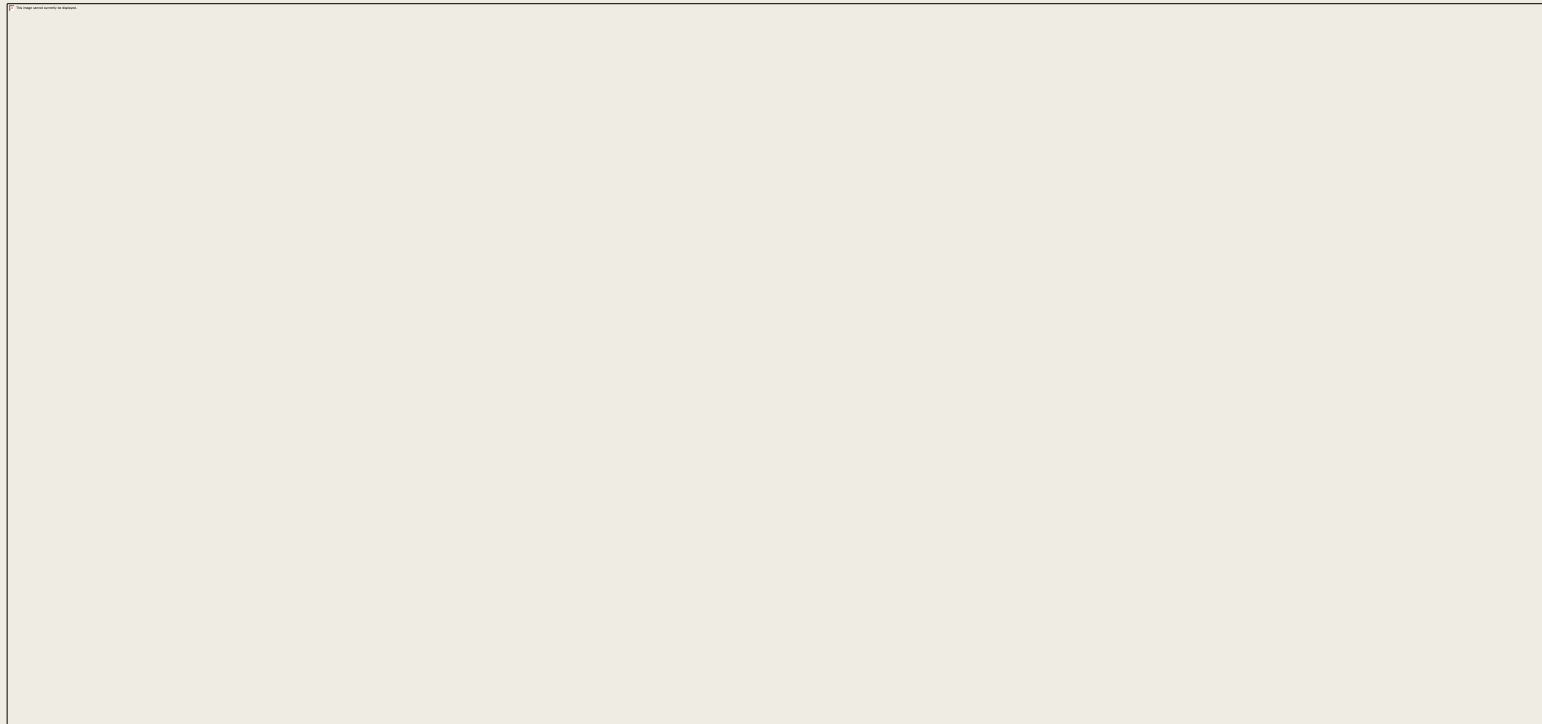


Vs.



Prevalence

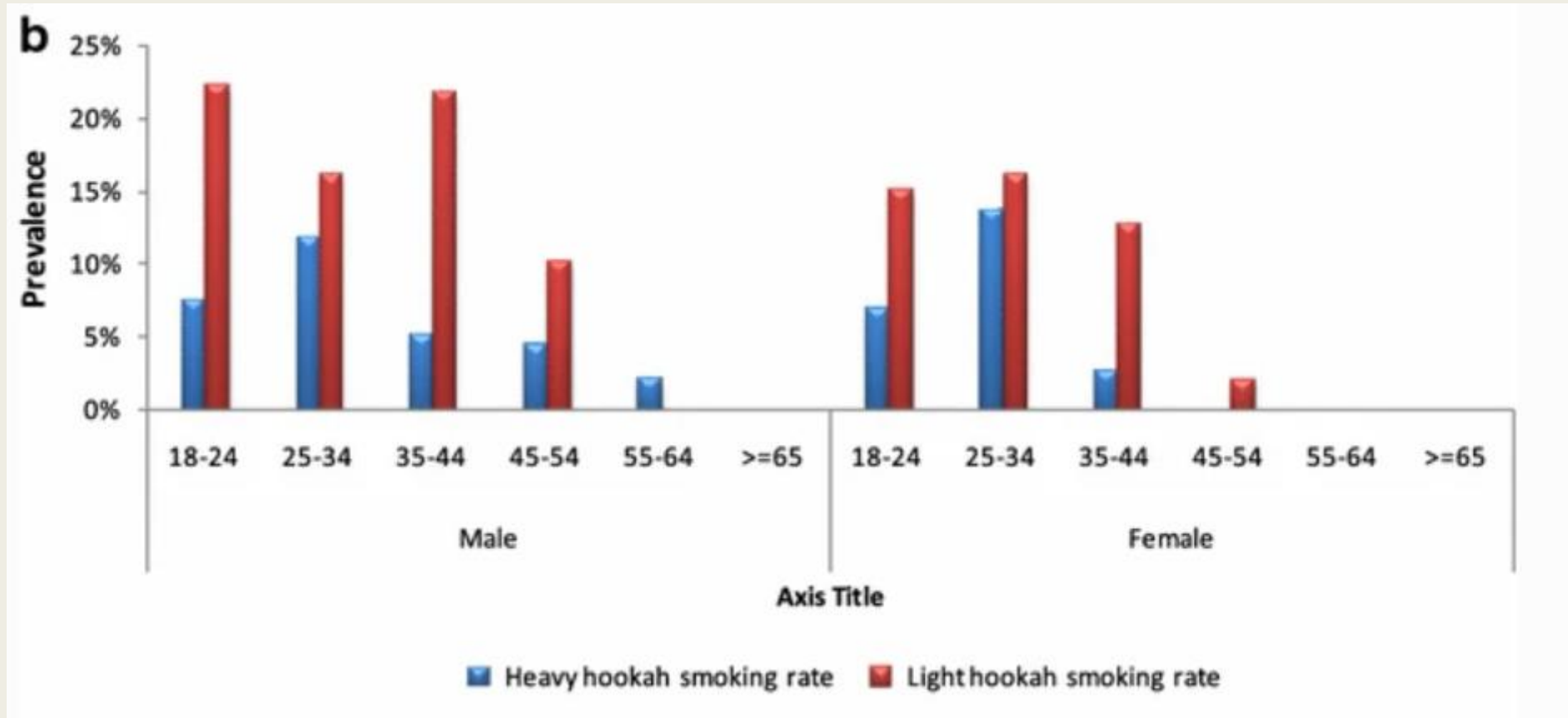
- Eastern Mediterranean Region (Middle East and North Africa) has highest number of consumers



Maziak W, Taleb ZB, Bahelah R, *et al.* The global epidemiology of waterpipe smoking
Tobacco Control 2015;**24**:i3-i12.

Prevalence in Jordan

870



Abu-Helalah, M.A., Alshraideh, H.A., Al-Serhan, A.A. *et al.* Epidemiology, attitudes and perceptions toward cigarettes and hookah smoking amongst adults in Jordan. *Environ Health Prev Med* **20**, 422–433 (2015). <https://doi.org/10.1007/s12199-015-0483-1>

2004 study in Dahia – Lebanon

Zoughaib SS, et, al.

- A total of 1461 students completed the questionnaire, of which 24% admitted regularly (> once/week) smoking the narghile and 14.4% occasionally, with a male predominance. The initiation was at about 13.6 yrs of age, but it varied from as low as 5 to 18 yrs. At least 28% of first narghile trial took place with a member of the immediate family, even though 58.2% initiated with a user friend.

Variable	Type of smoker								P-value	Total (n = 425)	
	Non-smokers (n = 183)		Cigarettes (n = 81)		WP (n = 75)		Mixed (n = 86)			No.	%
	No.	%	No.	%	No.	%	No.	%			
<i>Sex</i>											
Male	71	38.8	44	54.3	36	48.0	61	70.9	< 0.001	212	49.9
Female	112	61.2	37	45.7	39	52.0	25	29.1		213	50.1
<i>Marital status</i>											
Unmarried	90	49.2	27	33.3	39	52.0	37	43.0	0.06	193	45.4
Married	93	50.8	54	66.7	36	48.0	49	57.0		232	54.6
<i>Education</i>											
Low	8	4.4	16	19.8	13	17.3	9	10.5	< 0.001	46	10.8
Intermediate	72	39.3	42	51.9	27	36.0	29	33.7		170	40.0
High	103	56.3	23	28.4	35	46.7	48	55.8		209	49.2
<i>Work situation^a</i>											
Working	90	49.5	35	43.2	41	54.7	64	74.4	< 0.001	230	54.2
Not working	63	34.6	41	50.6	25	33.3	16	18.6		145	34.2
Student	29	15.9	5	6.2	9	12.0	6	7.0		49	11.6
<i>Residence</i>											
City	113	61.7	39	48.1	50	66.7	52	60.5	< 0.001	254	59.8
Town	66	36.1	31	38.3	24	32.0	21	24.4		142	33.4
Village	4	2.2	11	13.6	1	1.3	13	15.1		29	6.8
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		Mean	SD
Age ^b (years)	35.9	15.6	48.6	17.1	35.4	15.9	39.6	14.5	< 0.001	39.0	16.4
Weight ^c (kg)	68.3	13.9	73.0	14.3	71.0	14.8	79.1	12.2	< 0.001	71.8	14.4
Height ^d (m)	168.6	9.0	170.2	9.1	170.4	9.5	174.0	8.4	0.001	170.3	9.2
BMI ^e (kg/m ²)	23.9	4.1	25.1	3.9	24.4	4.7	26.2	3.6	< 0.001	24.7	4.2

^aTotal > 183 as some students also had jobs.

^bAge Tukey post-hoc tests: non-smoker = WP smoker = mixed smoker < cigarette smoker.

^cWeight Tukey post-hoc tests: non-smoker < cigarette smoker = WP smoker < mixed smoker.

^dHeight Tukey post-hoc tests: non-smoker = cigarette smoker = WP smoker < mixed smoker.

^eBMI Tukey post-hoc tests: non-smoker < cigarette smoker = WP smoker < mixed smoker.

WP = water pipe; SD = standard deviation; BMI = body mass index.

Waked, Mirna & Salameh, Pascale & Aoun-Bacha, Zeina. (2009). Water-pipe (narguile) smokers in Lebanon: A pilot study. Eastern Mediterranean health journal = La revue de santé de la Méditerranée orientale = al-Majallah al-ṣiḥḥīyah li-sharq al-mutawassiṭ. 15. 432-42. 10.26719/2009.15.2.432.

Water pipe and cancer?

Bou Fakhreddine, H et. Al : The growing epidemic of water pipe smoking: Health effects and future needs

- Data is still not well-established and there are many gaps to be filled using research.
- WP was found to double the risk of lung cancer (OR = 2.12, 95% CI 1.32–3.42) in a systematic review that included six trials studying the association of WPS and lung cancer
- In the same systematic review, Akl et al. found no significant association between WP smoking and bladder cancer (OR = 0.8, 95% CI = 0.2–4.0), esophageal cancer (OR = 1.85, 95% CI 0.95–3.58), nasopharyngeal cancer (OR = 0.49, 95% CI 0.20–1.23) or oral dysplasia (OR = 8.33, 95% CI 0.78–9.47)

- A sixfold greater risk of lung cancer was noted among former Lebanese WP smokers
- The evidence linking WPS and lung cancer is limited and more robust studies are needed to elucidate this relationship.
 - *Lack of control group in most studies, not accounting cigarette smoking, confounders....*
- Three case-control studies from India and Iran and a meta-analysis support an association between WPS and oesophageal cancer. One study showed twice the risk (OR=1.85, 95% CI 1.41 to 2.44) of oesophageal squamous cell carcinoma in WPS and a higher risk of cancer with greater intensity, duration and cumulative WPS.
- **In contrast to the well-known association between cigarette smoking and bladder cancer, two case-control studies reported a weak or non-existent association between bladder cancer and WPS.**



Bladder cancer

- Bladder cancer (BC) is the 9th most common cancer and the 14th leading cause of death due to cancer worldwide.
- The highest rates are reported in Europe, North America, Australia and Egypt, in comparison to the relatively low rates in the Far Eastern countries.
- In Lebanon, it is the second most reported cancer in males, and its incidence increases with age. It rarely occurs before the age of 40–50, and arise most frequently in the 7th decade of life.

Bladder cancer

- Histologically, most cases of BC are transitional cell carcinomas (TCC) (90%); rare are squamous cell carcinoma (3-5%), adenocarcinoma (0.5 to 2%), small cell carcinoma (less than 0.5%); and sarcoma, sarcomatoid tumours, paraganglioma, melanoma and lymphoma (less than 0.1%).
- The most common presentation symptoms of bladder cancer are hematuria, pollakiuria and dysuria.

Bladder cancer- Risk Factors

- Risk factors associated with bladder cancer are: smoking (cigarettes), arsenic in drinking water (concentration higher than 300 $\mu\text{g}/\text{l}$), arsenic exposure (in air, food, occupational hazards), occupational exposure to aromatic amines (2-naphthylamine, 4-aminobiphenyl and benzidine) and 4,4'-methylenebis (2-chloroaniline).
- The last two risk factors can be found in the chemical, dye and rubber industries, in hair dyes, paints, fungicides, cigarette smoke, plastics, metal and motor vehicle exhaust.



Bladder Cancer in Lebanon

- Lebanon, a developing country in the Middle East, was found to have one of the highest estimated age-standardized incidence rates of bladder cancer worldwide. The incidence rates of bladder cancer in Lebanese males are nearly double the rates reported in neighboring countries, which triggered interest in its possible aetiology considering their lifestyle.
- Tobacco smoke is the most recognized risk factor for both TCC and non-TCC BC, and the prevalence of smoking in Lebanon is among the highest recorded in the region.

Previous literature bridging WPS and Bladder Cancer

- Data linking WPS to bladder cancer is scarce globally and limited to literature reviews and some case controls. Zheng et al found that those who ever smoked a waterpipe, but did not smoke cigarettes, had a borderline significant association with an increased risk of urothelial carcinoma (OR =1.3), and there was no association observed between squamous cell carcinoma and WPS
- On the other hand, Roohullah et al, found that waterpipe use likely increased the risk of bladder carcinoma
- Contrary to the recognized association of cigarette smoking with bladder cancer, an insignificant association was observed between WPS and bladder cancer (Bedwani et al., 1997; Zheng et al., 2012). Both the case-control studies were carried out in Egypt and reported the results adjusting the cigarette smoking and other cofounding factors

Zheng Y.L., et al. Urinary bladder cancer risk factors in Egypt: a multicenter case-control study. *Cancer Epidemiol Biomarkers Prev*, 2012. 21(3): p. 537-46. 20
Roohullah, et al. Cancer urinary bladder–5 year experience at Cenar, Quetta. *J Ayub Med Coll Abbottabad*, 2001. 13(2): p. 14-6.

Multicenter Study: AUBMC & KHCC



- 274 bladder cancer patients enrolled from AUBMC
- 158 bladder cancer patients from KHCC
- The questionnaire consisted of demographic data, family history of bladder cancer, medical history of the patient, exposure history to the risk factors of bladder cancer and their social habits. The type of smoking was meticulously documented, whether cigarettes or WPS or other types of smoking. If the patient is a WP smoker, a lot of questions aimed at investigating the smoking frequency, quantity, flavor preference among other characteristics.

Second-hand smoking: Lebanon vs. Jordan

			Lebanon_Jordan		Total
			Lebanon	Jordan	
2nd hand smoking	1	Count	193	74	267
		% within Lebanon_Jordan	70.7%	46.8%	61.9%
	2	Count	80	84	164
		% within Lebanon_Jordan	29.3%	53.2%	38.1%
Total		Count	273	158	431
		% within Lebanon_Jordan	100.0%	100.0%	100.0%

Current WPS smokers: Lebanon

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	4.0	4.0	4.0
	2	263	96.0	96.0	100.0
	Total	274	100.0	100.0	

WPS Sharing: Lebanon

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	1.1	27.3	27.3
	2	8	2.9	72.7	100.0
	Total	11	4.0	100.0	
Missing	System	263	96.0		
Total		274	100.0		

Current WPS smokers: Jordan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	10.1	10.1	10.1
	2	142	89.9	89.9	100.0
	Total	158	100.0	100.0	

WPS Sharing: Jordan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	3.8	50.0	50.0
	2	6	3.8	50.0	100.0
	Total	12	7.6	100.0	
Missing	System	146	92.4		
Total		158	100.0		

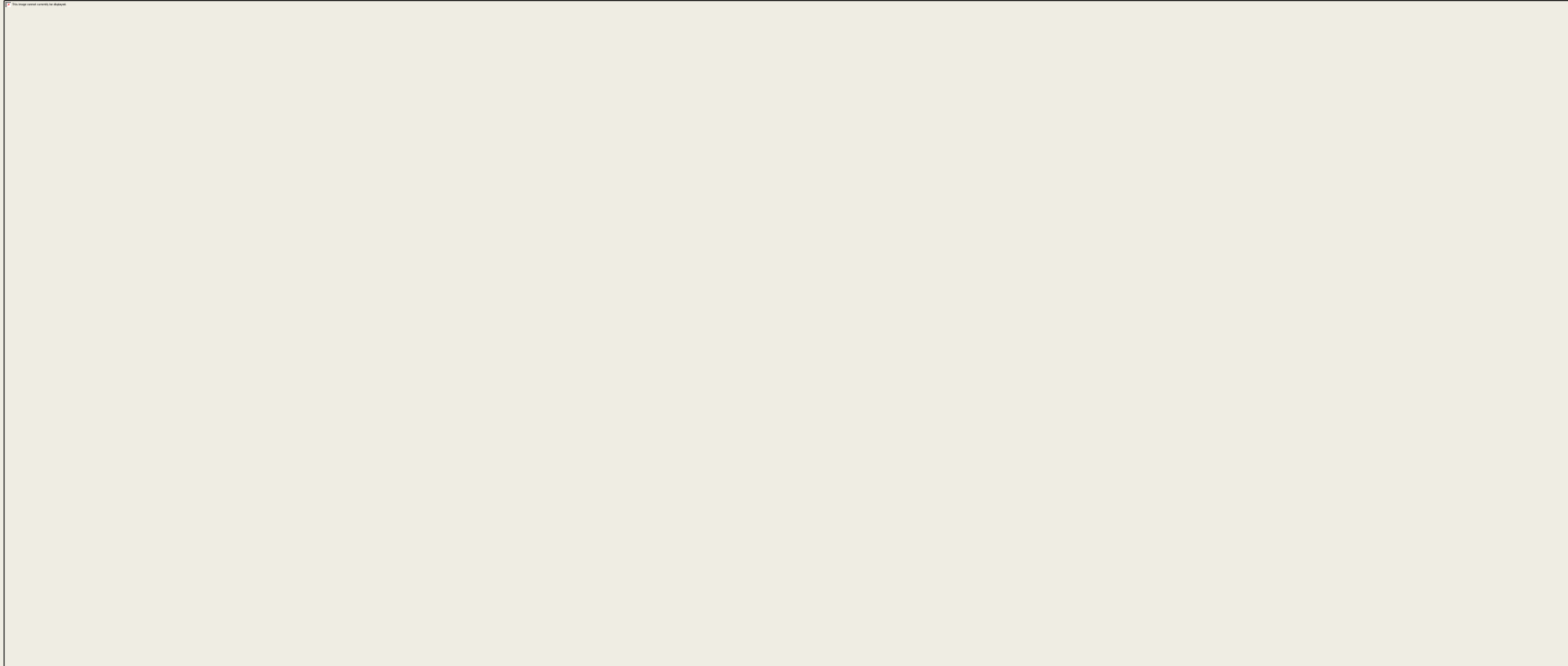
Bladder Cancer invasion

P<0.001

			Lebanon_Jordan		Total
			Lebanon	Jordan	
Invasion 1	Count	67	84	151	
	% within Lebanon_Jordan	28.5%	60.0%	40.3%	
2	Count	168	56	224	
	% within Lebanon_Jordan	71.5%	40.0%	59.7%	
Total	Count	235	140	375	
	% within Lebanon_Jordan	100.0%	100.0%	100.0%	

Bladder Cancer Grade

p=0.491



Family History

			Lebanon_Jordan		Total
			Lebanon	Jordan	
FHx	1	Count	21	22	43
		% within Lebanon_Jordan	7.7%	13.9%	10.0%
	2	Count	253	136	389
		% within Lebanon_Jordan	92.3%	86.1%	90.0%
Total		Count	274	158	432
		% within Lebanon_Jordan	100.0%	100.0%	100.0%

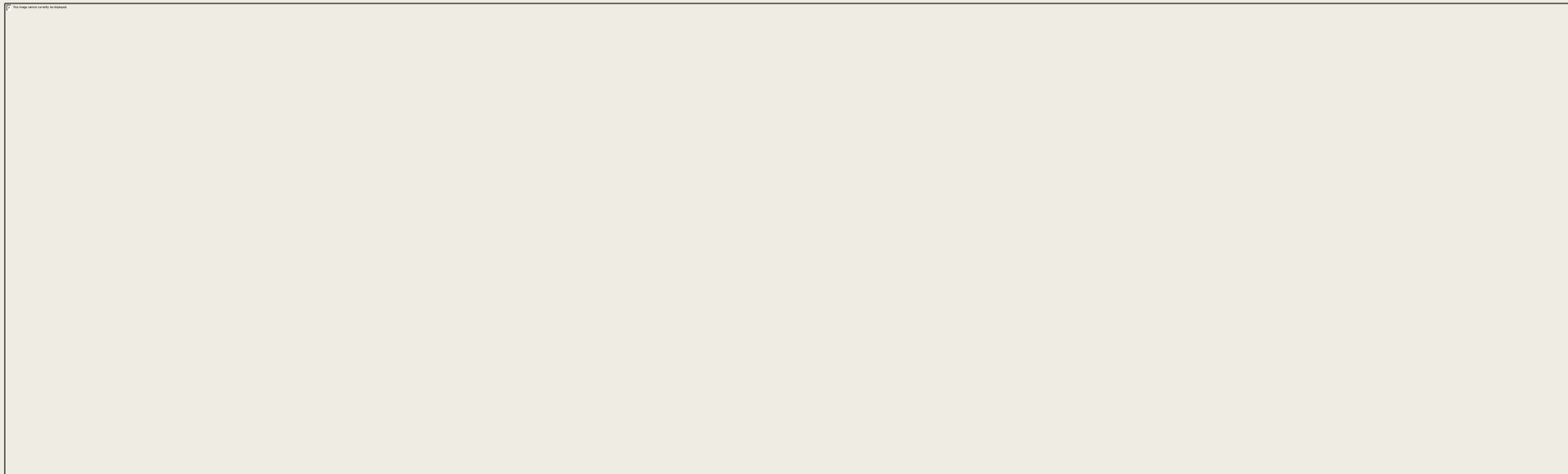
Dye Exposure

p=0.022

			Lebanon_Jordan		Total
			Lebanon	Jordan	
Dye Exposure 1	Count	54	18	72	
	% within Lebanon_Jordan	19.7%	11.4%	16.7%	
2	Count	220	140	360	
	% within Lebanon_Jordan	80.3%	88.6%	83.3%	
Total	Count	274	158	432	
	% within Lebanon_Jordan	100.0%	100.0%	100.0%	

Coal/Tar Exposure

$p=0.015$



Daily WPS Smokers

			Lebanon_Jordan		Total
			Lebanon	Jordan	
Daily Basis WPS	1	Count	15	5	20
		% within Lebanon_Jordan	57.7%	35.7%	50.0%
	2	Count	11	9	20
		% within Lebanon_Jordan	42.3%	64.3%	50.0%
Total		Count	26	14	40
		% within Lebanon_Jordan	100.0%	100.0%	100.0%

Briefing

Thank You