

Occupational exposures to disinfectants and pre-diabetes status among active nurses in Cyprus ¹

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1. *Supplementary Material, tables S1 and S2*
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Table S 1 Multivariate regression models of HbA1c against exposure to disinfectants using different exposure classification methods (JEM, JTEM, self-report) and adjusted for age, BMI and number of night shifts per month. In total, n=145 participants with complete data were included in the regression analysis.

Included in the Regression analysis:							
Disinfectant	Exposure metric	Exposure Category	N (%)	HbA1c			
				β	CI	p	
Alcohol and Phenols	JEM	Method 1	0	54 (37.2)	0.19	-0.02 – 0.40	0.08
			1	91 (62.8)			
		Method 2	0	86 (59.3)	0.02	-0.19 – 0.22	0.86
			1	59 (40.7)			
	JTEM	Method 1	0	29 (20.0)	0.21	-0.04 – 0.46	0.09
			1	116 (80.0)			
		Method 2	0	76 (52.4)	0.08	-0.12 – 0.29	0.41
			1	69 (47.6)			
	Self-reported (# times used per week)	Never		3 (2.1)	NA*	NA*	NA*
		<1		0 (0)			
		1to3		14 (9.7)			
4to7			128 (88.3)				
QACs	JEM	Method 1	0	105 (72.4)	-0.13	-0.36 – 0.09	0.24
			1	40 (27.6)			
		Method 2	0	123 (84.8)	-0.34	-0.62 – -0.07	0.02
			1	22 (15.2)			
	JTEM	Method 1	0	121 (83.4)	0.05	-0.22 – 0.32	0.71
			1	24 (16.6)			
		Method 2	0	130 (89.7)	0.02	-0.31 – 0.35	0.9
			1	15 (10.3)			
	Self-reported	Never		132 (91.0)	-0.09	-0.51 – 0.33	0.67
		<1		9 (6.2)			

Octenidine			1to3	3 (2.1)	-0.01	-0.72 – 0.71	0.98	
			4to7	1 (0.7)	-0.03	-1.25 – 1.19	0.96	
	JEM	Method 1	0	79 (54.5)	0.23	0.03 – 0.43	0.02	
			1	66 (45.5)				
		Method 2	0	76 (52.4)	-0.03	-0.23 – 0.17	0.78	
			1	69 (47.6)				
	JTEM	Method 1	0	70 (48.3)	0.19	-0.01 – 0.39	0.06	
			1	75 (51.7)				
		Method 2	0	74 (51.0)	-0.01	-0.21 – 0.19	0.94	
			1	71 (49.0)				
	Self-reported	Never		13 (9.0)				
		<1		7 (4.8)	-0.01	-0.58 – 0.56	0.98	
		1to3		26 (17.9)	0.16	-0.26 – 0.57	0.46	
		4to7		99 (68.3)	0.11	-0.26 – 0.48	0.55	
	Iodine	JEM	Method 1	0	76 (52.4)	-0.03	-0.23 – 0.17	0.78
				1	69 (47.6)			
Method 2			0	76 (52.4)	-0.03	-0.23 – 0.17	0.78	
			1	69 (47.6)				
JTEM		Method 1	0	75 (51.7)	0.03	-0.17 – 0.23	0.77	
			1	70 (48.3)				
		Method 2	0	72 (49.7)	-0.04	-0.24 – 0.16	0.68	
			1	73 (50.3)				
Self-reported		Never		55 (37.9)				
		<1		33 (22.8)	-0.18	-0.45 – 0.09	0.18	
		1to3		25 (17.2)	0.02	-0.27 – 0.31	0.89	
		4to7		32 (22.1)	-0.07	-0.34 – 0.20	0.61	
JEM		Method 1	0	79 (54.5)	-0.23	-0.44 – -0.03	0.03	

Hydrogen peroxide	JTEM	Method 2	1	66 (45.5)	0.03	-0.19 – 0.26	0.77
			0	103 (71.0)			
		Method 1	1	42 (29.0)	-0.01	-0.22 – 0.20	0.9
			0	89 (61.4)			
		Method 2	1	56 (38.6)	0.04	-0.18 – 0.25	0.73
			0	95 (65.5)			
	Self-reported	Never	1	50 (34.5)	-0.03	-0.38 – 0.32	0.87
		<1		116 (80.0)			
		1to3		14 (9.7)			
		4to7		12 (8.3)			
Chlorine	JEM	Method 1	0	3 (2.1)	-0.1	-0.76 – 0.68	0.91
			1	110 (75.9)			
		Method 2	0	35 (24.1)	0.07	-0.34 – 0.13	0.4
			1	45 (31.0)			
	JTEM	Method 1	0	100 (69.0)	-0.04	-0.15 – 0.29	0.52
			1	88 (60.7)			
		Method 2	0	57 (39.3)	-0.05	-0.25 – 0.17	0.68
			1	82 (56.6)			
	Self-reported	Never	1	63 (43.4)	-0.16	-0.25 – 0.16	0.65
		<1		88 (60.7)			
Peracetic acid	JEM	Method 1	0	9 (6.2)	-0.18	-0.58 – 0.26	0.46
			1	19 (13.1)			
		Method 2	0	29 (20.0)	0.04	-0.49 – 0.13	0.25
			1	49 (33.8)			
				0.04		-0.22 – 0.31	0.75
Peracetic acid	JEM	Method 1	0	106 (73.1)	0.22	-0.00 – 0.45	0.05
			1	39 (26.9)			
		Method 2	0	96 (66.2)	0.22	0.01 – 0.43	0.04
			1	49 (33.8)			

Phthalaldehydes	JTEM	Method 1	0	87 (60.0)	0.31	0.11 – 0.51	0
			1	58 (40.0)			
		Method 2	0	81 (55.9)	0.15	-0.05 – 0.36	0.14
			1	64 (44.1)			
	Self-reported	Never		132 (91.0)			
		<1		5 (3.4)	0.31	-0.25 – 0.86	0.28
		1to3		1 (0.7)	0.31	-0.90 – 1.53	0.61
		4to7		7 (4.8)	0.04	-0.43 – 0.51	0.86
	JEM	Method 1	0	145 (100)	NA	NA	NA
			1	0 (0)			
		Method 2	0	123 (84.8)	-0.05	-0.33 – 0.23	0.71
			1	22 (15.2)			
	JTEM	Method 1	0	124 (85.5)	0.08	-0.21 – 0.37	0.59
			1	21 (14.5)			
		Method 2	0	118 (81.4)	-0.01	-0.27 – 0.25	0.93
			1	27 (18.6)			
	Self-reported	Never		140 (96.6)			
		<1		1 (0.7)	0.3	-0.92 – 1.51	0.63
		1to3		0 (0)	NA	NA	NA
		4to7		4 (2.8)	-0.02	-0.65 – 0.60	0.94
Chlorhexidine	JEM	Method 1	0	72 (49.7)	-0.17	-0.37 – 0.03	0.1
			1	73 (50.3)			
		Method 2	0	85 (58.6)	-0.04	-0.24 – 0.17	0.72
			1	60 (41.4)			
	JTEM	Method 1	0	77 (53.1)	-0.13	-0.33 – 0.07	0.21
			1	68 (46.9)			
		Method 2	0	111 (76.6)	-0.01	-0.25 – 0.23	0.94

Ammonia	Self-reported	Never	1	34 (23.4)			
		<1		96 (66.2)			
		1to3		8 (5.5)	-0.09	-0.53 – 0.36	0.7
		4to7		23 (15.9)	-0.22	-0.50 – 0.06	0.13
	JEM	Method 1	0	18 (12.4)	-0.01	-0.32 – 0.30	0.95
		Method 1	1	114 (78.6)	-0.32	-0.56 – -0.08	0.01
		Method 2	0	31 (21.4)	-0.2	-0.63 – 0.22	0.35
		Method 2	1	136 (93.8)	-0.05	-0.32 – 0.22	0.7
	JTEM	Method 1	0	119 (82.1)	0.02	-0.29 – 0.33	0.91
		Method 1	1	26 (17.9)			
		Method 2	0	127 (87.6)			
		Method 2	1	18 (12.4)			
	Self-reported	Never		139 (95.9)			
		<1		1 (0.7)	0.29	-0.93 – 1.50	0.64
		1to3		3 (2.1)	-0.11	-0.85 – 0.63	0.77
		4to7		2 (1.4)	-0.17	-1.06 – 0.71	0.7
Formaldehyde	JEM	Method 1	0	105 (72.4)	-0.13	-0.36 – 0.09	0.24
		Method 1	1	40 (27.6)			
		Method 2	0	105 (72.4)	-0.13	-0.36 – 0.09	0.24
		Method 2	1	40 (27.6)			
	JTEM	Method 1	0	98 (67.6)	-0.13	-0.34 – 0.09	0.25
		Method 1	1	47 (32.4)			
		Method 2	0	98 (67.6)	-0.13	-0.34 – 0.09	0.25
		Method 2	1	47 (32.4)			
	Self-reported	Never		124 (85.5)			
		<1		8 (5.5)	0.05	-0.39, 0.48	0.84

1to3	8 (5.5)	-0.44	-0.88, -0.01	0.05
4to7	5 (3.4)	0.36	-0.19, 0.90	0.21

* NA: No reporting of use of the specific disinfectant

* For the Exposure Category, 0 indicates low exposure, 1 indicates high exposure.

Table S 2 Crude and multivariate linear regression models of HbA1c levels after sensitivity analyses with biomarkers of exposure to disinfection by-products and shift work.

	Crude			Adjusted for age, BMI, sex, smoking status and alcohol consumption		
	β	95% CI	p	β	95% CI	p
TCM (ng/g)	0.01	-0.02 – 0.05	0.56	0.02	-0.01 – 0.06	0.18
BrTHM(ng/g)	-0.32	-0.55 – -0.09	0.01	-0.25	-0.47 – -0.03	0.03
TTHM (ng/g)	-0.01	-0.08 – 0.07	0.88	0.02	-0.06 – 0.09	0.66
Night shifts per month	0.00	-0.03 – 0.04	0.91	0.03	-0.01 – 0.07	0.09
Sampling time (ref: morning)						
Noon	0.21	0.05 – 0.36	0.01	0.12	-0.03 – 0.27	0.11
Afternoon	0.41	0.25 – 0.57	<0.001	0.33	0.17 – 0.48	<0.001

* The effects of TCM, BrTHM and TTHM were also adjusted for creatinine.