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Abstract

Analysis of Influencing Factors on Female Hairdresser's Neuropsychiatric Symptoms Due to Chronic Organic Solvent Exposure

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Objectives: This study was designed to examine the influencing factors on female hairdresser's neuropsychiatric symptoms due to chronic organic solvent exposure.

Methods: We collected data from 143 female hairdressers employed in 75 hair salons selected by random sampling from the telephone directory of Gangnung City. Using multiple regression analysis we analyzed the influencing factors (i.e. ventilating fans, air-cleaners, work duration, total time of exposure to solvents during hair-dyeing and permanent, etc.) on neuropsychiatric symptoms.

Results: The neuropsychiatric symptom scores were significantly positively correlated with the total time of hair-dyeing work and work duration, and significantly negatively correlated with the glove wearing proportion. However, the total time of permanent work, ventilating fans and air-cleaners were not significantly correlated.

Conclusions: The results of this study suggest that for the prevention of neuropsychiatric symptoms due to chronic organic solvent exposure, more attention is required regarding hair-dyeing work than permanent work and to skin absorption rather than respiratory inhalation.

Key Words : Hairdresser, Neuropsychiatric symptom, Organic solvent, Hair-dyes

Stovall , 1983; Sutthipisal , 1993),
(Leino , 1997; Macchioni ,
1999), (Blatruai
Zielhuis, 1993; Kersemaekers , 1995),
Carcinogenity(Hartge , 1982; Pukkala
, 1992; Wakai , 1993; Boffetta , 1994;
Herrinton , 1994)

(1998)
(1998)가

(2000)

3000

(1999)

30%가

184

119

(Stock Cone, 1998),

가

가

(Zenz, 1994).

가

10~20%가

가

(Walle

Brunsveld, 1994),

(Schwartz , 1990), ammonium

persulphate

(Gamboa , 1989),

(Starr , 1982) 가

가

(Douglas , 1986; 가

Anne , 1987; , 1991) 가

가

(Hollund Moen, 1998; Leino ,

1999),

(Rapaport, 1983;

1. (1993) 가 가 (1998) 1999 372 (1993) 100 100 75 143 가

2. (1993) ICD-9 가 가 (screening) 33 (: 0~36) 1999 0% 100% (1993) 가 test-retest, Cronbach's 가 test-retest 0.581 가 Cronbach's 0.918

3. 1995 PC-SAS 6.11 t-test stepwise 가 (variance inflation

Cronbach's 0.69, 0.86 가 (1997)

factor)
 가 10 87.4%, 2.8%가
 64.64 , 2.50
 1.
 30.25 143 가 16.16 21.51
 ; , 가 16.8%, 60.8% 가 30.16 , 18.67
 , 가 62.70 가 0 ,
 26 , 4.46 (Table 1).
 5.6%

Table 1. General Characteristics and Work-related Characteristic

Variables	Mean±S.D./ N(%)
Age	30.25± 8.28
Marriage	Never 73(51.1%) Ever 70(49.9%)
Smoking	Never 119(83.2%) Ever 24(16.8%)
Alcohol	Never 56(39.2%) Ever 87(60.8%)
Exercise No	135(94.4%) Yes 8(5.6%)
Disease	No 118(84.3%) Yes 22(15.7%)
Ventilating fan	No 18(12.6%) Yes 125(87.4%)
Air-cleaner	No 139(97.2%) Yes 4(2.8%)
Working time(hour/week)	64.64±12.93
Resting time(hour/day)	2.50± 2.08
Glove(%)*	95.12±15.47
Colleagues(person)	3.95± 4.25
Work duration(years)	8.22± 6.42
Dyeing	Customer/week 16.16±15.59 Time(min) 33.71±22.74
Permanent	Customer/week 21.51±17.25 Time(min) 62.70±46.94
Cut	Customer/week 30.16±24.70 Time(min) 21.31± 7.84
Shampoo	Customer/week 18.67±24.07 Time(min) 10.42±12.13
Symptom score	4.46± 4.69

* Glove(%) = Glove wearing time×100/total time in dyeing and permanent work

Table 2. Distribution of symptom scores by variables

Variables		Means	S. D.
Marriage	Never	4.30	4.86
	Ever	4.64	4.53
		t=0.43	
Smoking	Never	4.47	4.50
	Ever	4.41	5.64
		t=0.06	
Alcohol	Never	4.46	4.31
	Ever	4.47	4.95
		t=0.01	
Exercise	No	4.45	4.66
	Yes	4.62	5.50
		t=0.10	
Disease	Never	3.69	3.71
	Ever	8.09	7.13
		t=2.82**	
Ventilating fan	No	4.88	5.34
	Yes	4.40	4.61
		t=0.40	
Air-cleaner	No	4.50	4.72
	Yes	3.25	3.86
		t=0.52	

* P<0.05, ** P<0.01, *** P<0.001

2.

0.05

(p<0.01)

가 (Table 2),

(p<0.001),

(p<0.05),

(p<0.01)

(Table 3).

3.

(p<0.01),

(p<0.001),

(p<0.05).

Stepwise

(p<0.001),

(p<0.01),

(p<0.001)

Table 3. Result of Correlation Analysis

	Symptom score	Age	Working time	Resting time	Glove	Colleagues	Work duration	Dyeing	Permanent	Cut	Shampoo
Symptom score	1.00	-	-	-	-	-	-	-	-	-	-
Age	-0.02	1.00	-	-	-	-	-	-	-	-	-
Working time	0.14	0.00	1.00	-	-	-	-	-	-	-	-
Resting time	0.01	-0.17	0.04	1.00	-	-	-	-	-	-	-
Glove [†]	-0.31***	0.07	-0.12	0.03	1.00	-	-	-	-	-	-
Colleagues	0.04	-0.34***	0.02	-0.04	0.02	1.00	-	-	-	-	-
Work duration	0.11	-0.08	0.03	0.28***	0.08	0.10	1.00	-	-	-	-
Dyeing	0.03	-0.16	-0.01	-0.03	0.13	0.02	-0.08	1.00	-	-	-
Permanent	-0.19*	-0.04	-0.17*	-0.15	0.11	0.12	-0.02	0.55	1.00	-	-
Cut	-0.11	0.02	-0.18*	-0.22*	0.06	0.08	-0.19*	0.57***	0.86***	1.00	-
Shampoo	-0.26**	0.01	-0.21*	-0.23**	0.12	0.03	-0.19*	0.50***	0.87***	0.88***	1.00

* P<0.05, ** P<0.01, *** P<0.001

[†] Glove(%) = Glove wearing time × 100 / total time in dyeing and permanent work
no. of customer × time in such work

Table 4. Result of Multiple Regression Analysis

Variables	Full-model			Reduced-model		
	Parameter Estimate	T-value	Variance Inflation	Parameter Estimate	T-value	Variance Inflation
Intercept	11.127	2.12*	0.00	16.079	5.81***	0.00
Age	0.026	0.35	2.95	-	-	-
Marriage	0.654	0.51	3.10	-	-	-
Smoking	-0.620	-0.55	1.36	-	-	-
Alcohol	-0.296	-0.32	1.49	-	-	-
Exercise	-0.552	-0.28	1.18	-	-	-
Disease	4.631	4.11***	1.14	4.371	4.28***	1.07
Ventilating fan	-1.718	-1.48	1.15	-1.587	-1.47	1.09
Air cleaner	-1.549	-0.67	1.26	-2.300	-1.02	1.15
Working time	-0.008	-0.29	1.27	-	-	-
Resting time	-0.175	-0.93	1.21	-	-	-
Glove [‡]	-0.085	-2.49**	1.20	-0.122	-4.57**	1.09
Colleagues	0.071	0.38	1.38	-	-	-
Work duration	0.168	2.46*	1.37	0.093	1.61	1.05
Dyeing	0.001	2.40*	1.74	0.001	2.77**	1.38
Permanent	-0.001	-1.64	6.88	-	-	-
Cut	0.002	1.92	6.77	-	-	-
Shampoo	-0.002	-1.43	7.15	-0.001	-2.52*	1.50
R-square	0.3367			0.3506		

* P<0.05, ** P<0.01, *** P<0.001

‡ Glove(%) = Glove wearing time×100/total time in dyeing and permanent work
no. of customer × time in such work

(p<0.05)

(Table 4).

가

(Stock Cone, 1998),

Pollan Gustavsson(1999)

가

Hairdresser Beautician

, John (1994)

가 가

(, 2000),

(Mamelle , 1984; Nurminen , 1989;

Launer , 1990; Teitelman , 1990).

(Zenz, 1994).

90%

20ml

4 (, 1998). 가
(, 1995). 가
(1989), (1987), (Zenz, 1994), Krajewska (1980)
(1992), (1993), (1998)
(1997), (1997) 가
가 가 ,
가 가 가
가 가
Morrow (1989)
(Benignus, 1981;
Fonnazzari , 1983; Candura , 1991;
, 1993) 가 가
가 Morrow
(1990)
WHO (1986) , , , , ,
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(Susan , 1996). 가
가 (Abramson, 1994).
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(1987) Anger Johnson(1992)
가 가

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