Auricular Acupressure in Enhancing the Effectiveness of the Quality of Sleep

Taipei Veterans General Hospital

Lin-Ying Chiang

Yu-Chu Pai

Yui-Wen Huang

201, Shih-Pai Road, Sec 2, Taipei, Taiwan.

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Introduction (1)

Basic Human Need: Sleep

■ Insomnia characteristics: difficult in falling asleep, sleep interruption, early morning awakening.

■ Negative impact of insomnia: bad performance, fatigue, poor concentration, bad temper, etc…

■ Nurse shortage increased work loading, prolonged work hours, and consequanthy decreased sleep time.

■ Nurses worked over 12 hours

■ Rate of work error increased 3 times

■ Rate of near error increased 2 times

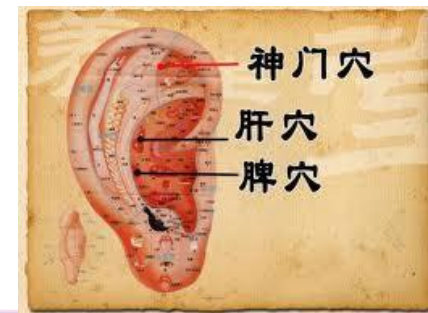■ Higher errors prtentially influenciy （Hughes & Rogers, 2004）

Introduction (2)

■ Nurses with shift work often suffer from insomnia

■ 72.7 % clinical nurses reported poor sleep quality (Ayten, 2012).

■ Nurses with shift work may experience autonomic nervous system disturbance, increased cardiac load, and their sympathetic activity was higher than daytime nurses even when they were sleeping(Flo et al., 2013).

■ With sleeping pills overcoming the discomfort of time difference. Long-term use or improper dosage causeing undesirable side effects, such as daytime lethargic, or drug dependence (Dorrian, et al., 2011).

■ Auricular acupressure with history year in china safe and with less side effects.

■ Acupuncture points massage (APM) play a regulatory role in bodily functions.

■ APM improving the rate of insomnia up to 94%.

Purpose

To explore the effectiveness of auricular pressure(AP) on sleep quality of nurses.
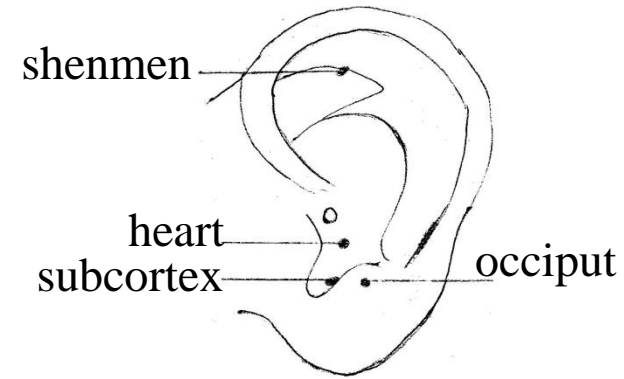
Method(1)

- Study design: pre-test and post-test for AP intervention
- Measurement Tools
  - Pittsburgh Sleep Quality Index
  - Piper Fatigue Scale
  - Epworth Sleepiness Scale
- Participants: purposive sampling
  - Nurses with score 5 and higher on the Pittsburgh Sleep Quality Index were recruited from a medical center of northern Taiwan.

Method(2)

shenmen
heart
subcortex
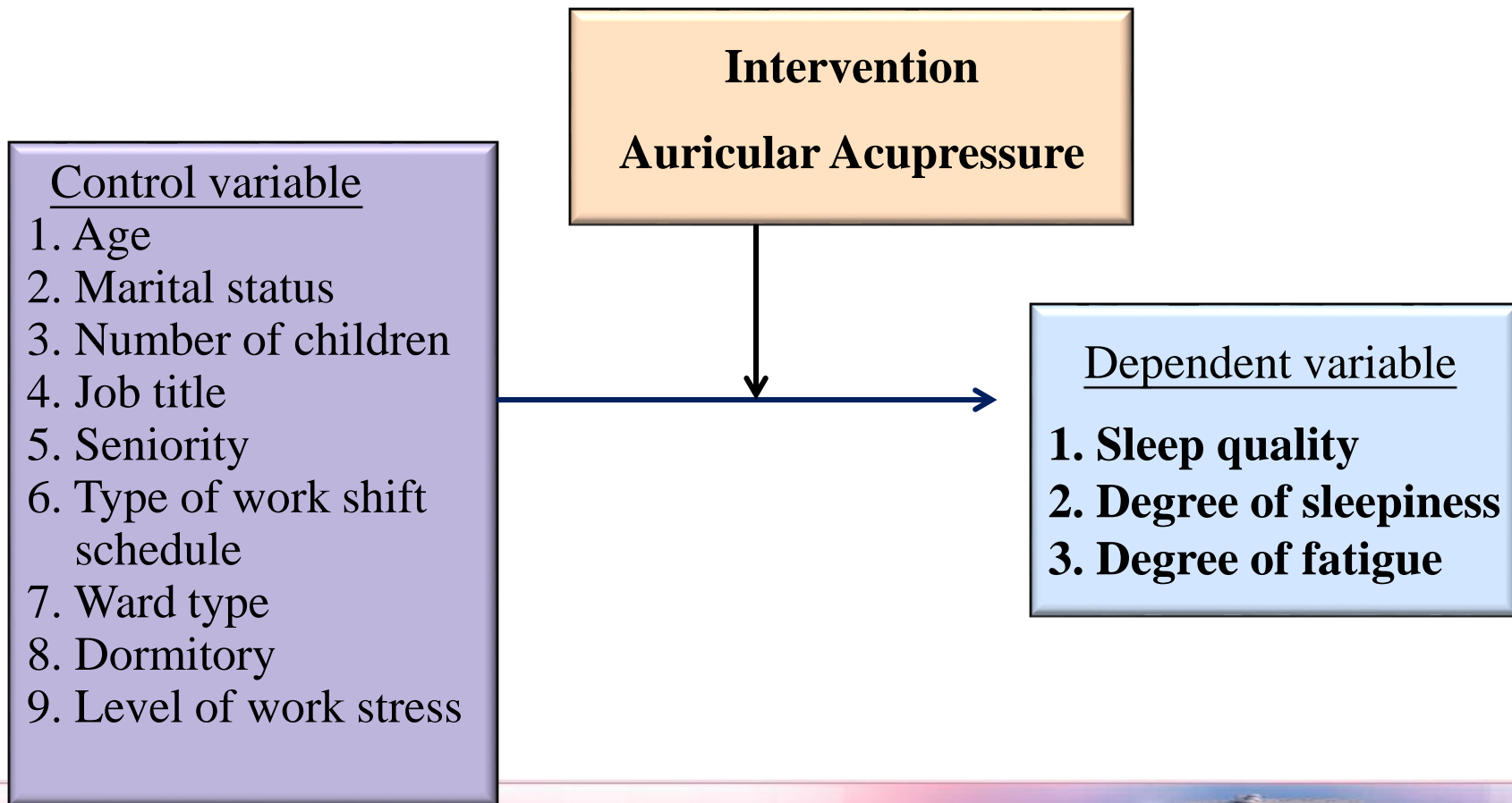occiput

- Intervention
    - Four ear pressure points: shenmen, heart, subcortex, and occiput, were located with 3M Nexcare acne dressing and received ear pressure intervention

- Data collection
    - baseline, two weeks and four weeks later
    - 88 subjects completed this study

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Conceptual Framework

Intervention

Auricular Acupressure

Control variable
1. Age
2. Marital status
3. Number of children
4. Job title
5. Seniority
6. Type of work shift schedule
7. Ward type
8. Dormitory
9. Level of work stress

Dependent variable

1. **Sleep quality**
2. **Degree of sleepiness**
3. **Degree of fatigue**

Method(3)

Obtain
1. Informed consent
2. Basic data
3. Pittsburgh Sleep Quality Index
   (1st screen+pre test)

→

Nurses with score 5 and higher were recruited

→

Auricular pressure points:
  1. Shenmen
  2. Heart
  3. Subcortex
  4. Occiput

↓

Auricular acupressure:
  1. Three times a day
  2. 2 minutes each time

←

Post test: Pittsburgh Sleep Quality Index
  1. Two weeks later
  2. Four weeks later

←

Analyze the effectiveness of auricular acupressure in sleep quality

Results(1)

■Auricular pressure improved sleep quality significantly
　■The average score of the Pittsburgh Sleep Quality Index
　decreased from 9.33 to 6.36（*p*=.000）

Score

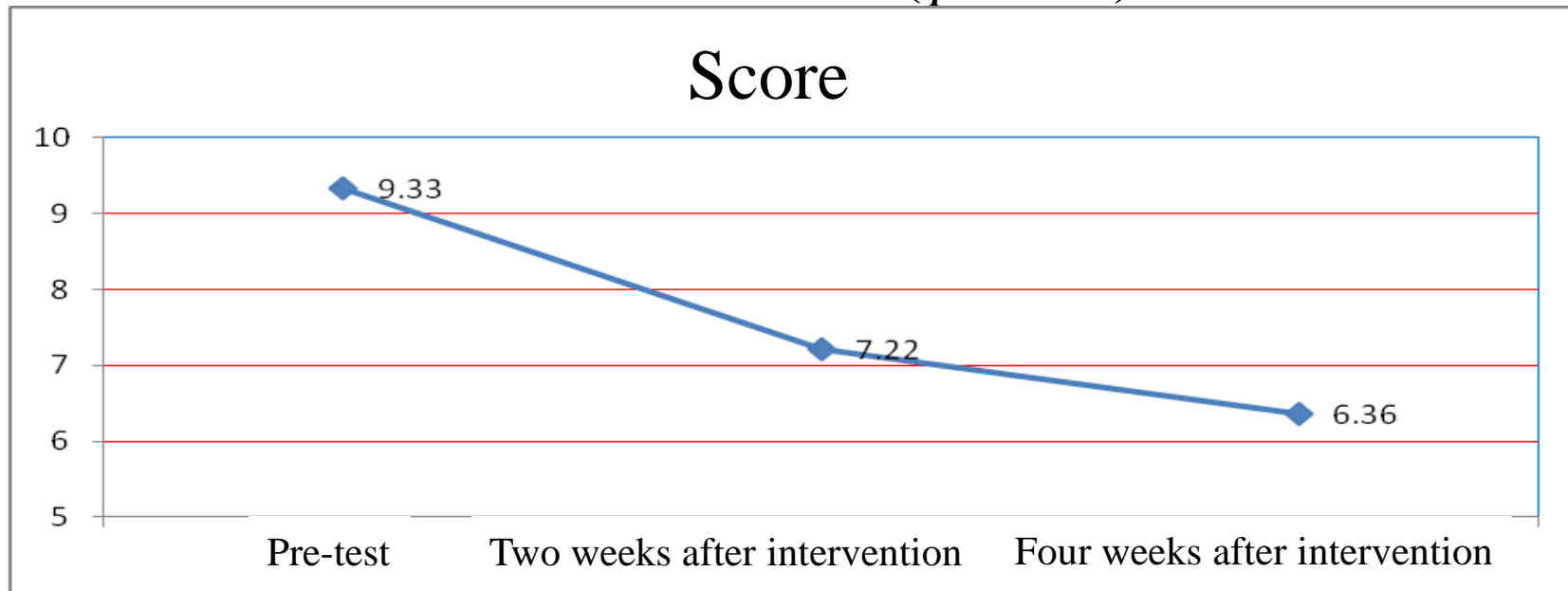| | Pre-test | Two weeks after intervention | Four weeks after intervention |

Figure I Comparison of sleep quality before and after auricular acupressure

Results(2)

■The average score of the fatigue scale decreased from 11.64 to 8.97（*p*=.000）
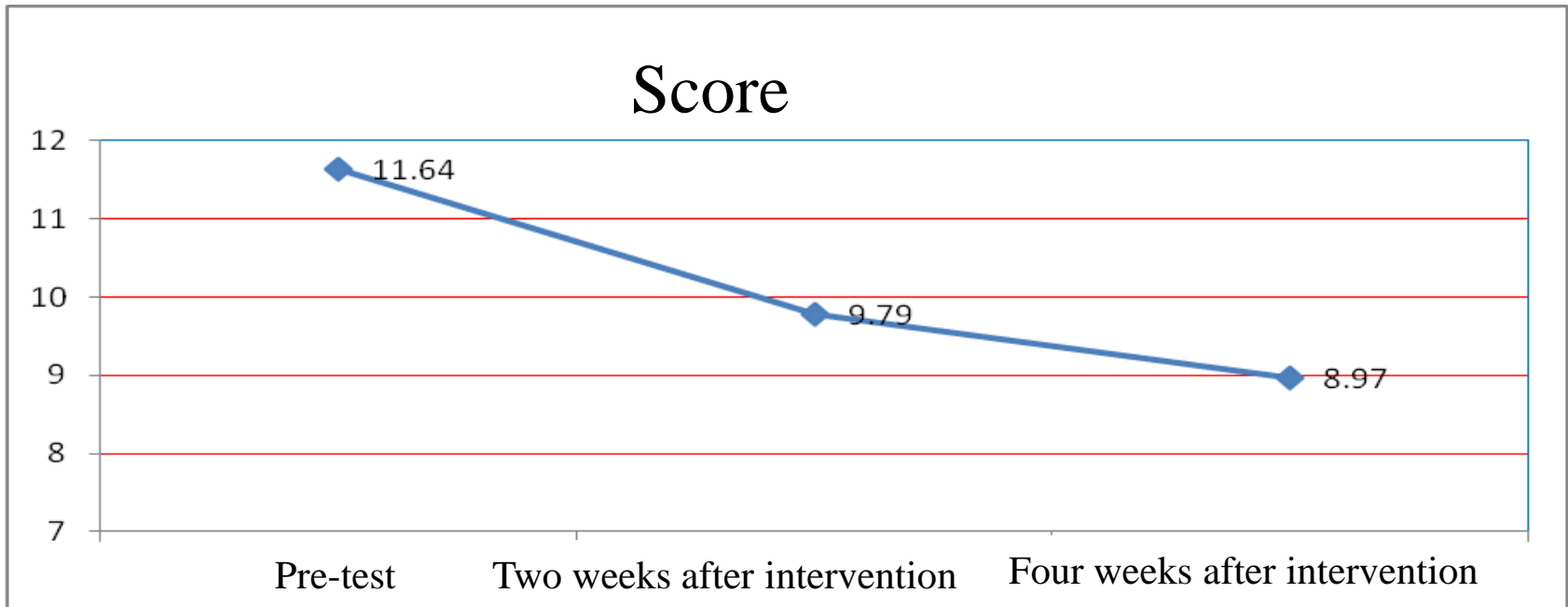

Figure Ⅱ Comparison of fatigue before and after auricular acupressure

Results(3)

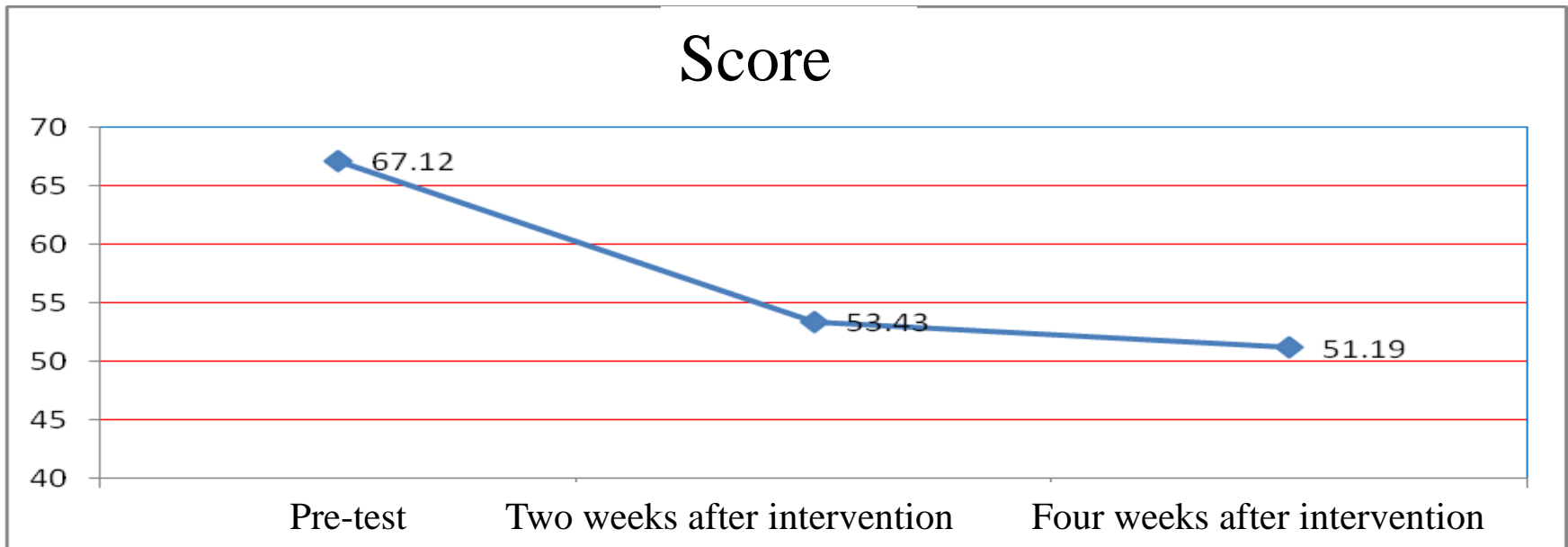■The average score of the sleepiness scale decreased from 67.13 to 51.19（*p*=.000）

Figure Ⅲ Comparison of sleepiness before and after auricular acupressure

Table I analysis of auricular pressed before, two weeks and after four weeks individual factors on the quality of sleep

Item	Pre-test				Two weeks after intervention				Four weeks after intervention			
	Mean	Standard deviation	F value /t value	p value	Mean	Standard deviation	F value /t value	p value	Mean	Standard deviation	F value /t value	p value
Age			.49	.612			.02	.979			.07	.929
Under 25	9.73	3.14			7.38	3.53			6.58	3.48		
26-30years old	8.97	2.42			7.19	3.40			6.52	3.25		
31years and older	9.32	3.09			7.26	3.61			6.26	3.46		
Marital status			-.11	.910			.89	.377			.68	.496
single	9.30	2.95			7.49	3.48			6.61	3.25		
Married	9.37	2.73			6.78	3.47			6.07	3.64		
Children			.16	.873			.80	.424			.64	.526
No	9.35	2.97			7.46	3.46			6.59	3.24		
Have	9.24	2.67			6.80	3.54			6.08	3.69		
Job title			.96	.386			.26	.775			1.64	.199
Contract Nursing	9.88	3.16			7.56	3.32			7.22	3.63		
Nurse	8.94	2.46			7.25	3.61			5.75	2.51		
Registered Nurse	9.10	3.08			6.85	3.59			6.45	4.07		
Working seniority			2.54	.062			2.26	.087			2.25	.089
5 years or less	9.75	2.98			7.68	3.37			7.11	3.46		
6-10 years	7.63	1.15			5.63	3.12			4.63	1.78		
11-15 years	10.00	2.95			8.67	3.50			6.33	2.46		
More than 16 years	9.31	3.30			6.75	3.66			6.50	4.32		
Properties of service units			1.29	.200			1.06	.290			.57	.573
General ward	9.55	2.83			7.50	3.43			6.56	3.11		
Special Unit	8.64	2.95			6.59	3.58			6.09	4.07		
Working time			-.391	.697			1.592	.115			.107	.915
Fixed classes	9.00	2.97			8.82	3.89			6.55	2.88		
Three shifts retirement	9.36	2.87			7.05	3.38			6.43	3.44		
Living the dormitory			-.38	.705			-1.33	.187			-.95	.345
No	9.18	2.74			6.71	3.25			6.05	3.50		
Have	9.42	2.99			7.70	3.61			6.74	3.25		
Your work pressure			.95	.392			4.65	.012*			1.49	.231
Low pressure	8.25	2.71			4.00	1.51			4.50	2.14		
Medium pressure	9.12	2.94			7.21	3.59			6.65	3.22		
High levels of stress	9.65	2.85			7.89	3.35			6.63	3.57		

The correlation of sleep quality and personal characteristics

◼Two weeks after intervention

    ◼Nurses with low work stress reported better sleep quality than nurses with high work stress (F = 4.65, p <.05)

Table Ⅱ analysis of auricular pressed before, two weeks and after four weeks individual factors on the sleepiness (N=88)

Item	Pre-test				Two weeks after intervention				Four weeks after intervention			
	Mean	Standard deviation	F value /t value	p value	Mean	Standard deviation	F value /t value	p value	Mean	Standard deviation	F value /t value	p value
Age Under 25 26-30years old 31years and older	13.46 12.42 9.94	3.05 6.17 4.34	4.19	.018*	10.08 9.90 7.71	4.65 6.01 4.76	1.92	.153	11.38 10.06 8.45	3.89 5.24 4.61	2.85	.064
Marital status single Married	12.36 10.70	5.00 4.72	1.46	.148	9.61 8.22	5.41 4.87	1.14	.257	10.39 8.74	4.71 4.72	1.52	.133
Children No Have	12.35 10.60	4.92 4.89	1.51	.136	9.67 7.96	5.35 4.92	1.38	.171	10.35 8.72	4.67 4.84	1.46	.148
Job title Contract Nursing Nurse Registered Nurse	13.53 11.22 10.30	4.30 5.13 5.04	3.28	.042*	11.13 8.39 7.50	4.98 5.19 5.11	3.85	.025*	11.75 9.42 7.75	4.57 4.14 5.16	5.10	.008**
Working seniority 5 years or less 6-10 years 11-15 years More than 16 years	13.59 10.56 10.08 9.69	4.55 5.27 4.42 4.74	4.10	.009**	11.09 6.56 8.83 6.81	5.15 4.38 4.30 5.26	4.95	.003**	11.75 7.63 10.00 6.94	4.34 3.90 3.89 5.08	6.59	.000***
Properties of service units General ward Special Unit	12.11 11.09	5.02 4.74	.83	.408	9.59 7.95	5.40 4.74	1.27	.208	10.45 8.18	4.30 5.67	1.72	.096
Working time Fixed classes Three shifts retirement	11.73 11.87	3.47 5.14	-0.89	.929	9.91 9.08	4.23 5.41	.488	.627	9.73 9.91	4.84 4.77	-.118	.906
Living the dormitory No Have	11.03 12.48	4.91 4.93	-1.37	.174	8.45 9.74	5.00 5.43	-1.14	.256	8.68 10.80	4.60 4.70	-2.11	.038*
Your work pressure Low pressure Medium pressure High levels of stress	9.75 10.71 13.07	3.77 4.61 5.12	3.17	.392	4.25 8.50 10.54	2.32 4.93 5.32	5.95	.004**	7.63 10.00 10.20	4.24 5.09 4.56	1.01	.367

The correlation of sleepiness and personal characteristics

■ Pre-test
- ■ Nurses aged under 25 years old reported higher sleepiness score than nurses aged over 31 years old. (F = 4.19, p <.05)
- ■ Nurses worked under 5 years reported higher sleepiness score than nurses worked over 16 years. (F = 4.10, p <.01)

■ Two weeks after intervention
- ■ Nurses worked under 5 years reported higher sleepiness score than nurses worked 6-10 years. (F = 4.95, p <.01)
- ■ Nurses worked with high work stress reported higher sleepiness score than nurses with low work stress. (F = 5.95, p <.01)

■ Four weeks after intervention
- ■ Nurses worked under 5 years reported higher sleepiness score than nurses worked over 16 years. (F = 6.59, p <.001)
- ■ Nurses lived in the staff dormitory reported higher sleepiness score than nurses who did not. (t = -2.11, p <.05)

TableⅢ analysis of auricular pressed before, two weeks and after four weeks individual factors on the fatigue

Item	Pre-test				Two weeks after intervention				Four weeks after intervention			
	Mean	Standard deviation	F value /t value	p value	Mean	Standard deviation	F value /t value	p value	Mean	Standard deviation	F value /t value	p value
Age			.63	.534			.35	.703			1.29	.282
Under 25	64.85	21.73			56.65	20.41			57.62	19.89		
26-30years old	71.58	28.83			54.16	22.40			50.61	24.24		
31years and older	65.74	23.59			51.35	27.46			47.94	24.68		
Marital status			-1.04	.300			-.30	.767			.41	.680
single	65.69	25.75			53.41	21.95			52.43	22.55		
Married	71.70	23.02			55.04	27.41			50.19	25.23		
Children			-5.8	.562			-.12	.903			.72	.471
No	66.56	25.81			53.71	22.46			52.87	23.48		
Have	70.00	23.00			54.40	26.78			48.88	23.00		
Job title			1.32	.273			1.28	.284			2.16	.122
Contract Nursing	64.31	22.73			58.94	21.95			58.34	21.82		
Nurse	72.69	28.03			52.22	21.91			47.06	21.57		
Registered Nurse	63.40	21.85			48.90	28.42			49.60	26.99		
Working seniority			.76	.520			2.53	.063			4.45	.006**
5 years or less	67.98	24.48			60.07	21.06			59.75	20.83		
6-10 years	72.31	32.32			44.00	20.28			38.38	19.35		
11-15 years	70.00	19.23			53.83	21.10			48.92	22.18		
More than 16 years	59.69	22.06			46.94	30.91			45.19	27.11		
Properties of service units			.50	.602			2.39	.019*			2.17	.033*
General ward	68.30	25.49			57.29	22.37			54.79	23.40		
Special Unit	65.23	23.73			43.77	24.84			42.59	20.86		
Working time			.079	.938			.818	.416			.911	6.844
Fixed classes	68.09	20.43			59.36	26.49			57.73	19.29		
Three shifts retirement	67.45	25.66			53.13	23.25			50.88	23.79		
Living the dormitory			.28	.780			-.08	.938			.06	.957
No	68.39	23.76			53.68	27.31			21.89	24.58		
Have	66.88	26.06			54.08	20.65			51.62	22.51		
Your work pressure			4.97	.009**			6.91	.002**			3.41	.038*
Low pressure	45.63	4.44			30.13	14.09			36.50	8.99		
Medium pressure	64.76	4.66			50.76	23.30			48.29	25.17		
High levels of stress	73.39	3.34			60.37	22.31			56.93	22.21		

The correlation of fatigue and personal characteristics :

■ Pre-test:
    ■Nurses worked with high work stress reported higher fatigue score than nurses with low work stress. ($F = 4.97$, $p <.01$)

■ Two weeks after intervention:
    ■Nurses worked in general ward reported higher fatigue score than nurses worked in ICU. ($t = 2.39$, $p <.05$)
    ■Nurses worked with high work stress reported higher fatigue score than nurses with low work stress. ($F = 6.91$, $p <.01$)

■ Four weeks after intervention:
    ■Nurses worked under 5 years reported higher fatigue score than nurses worked over 16 years. ($F = 4.45$, $p <.01$)
    ■Nurses worked in general ward reported higher fatigue score than nurses worked in ICU. ($t = 2.17$, $p <.05$)
    ■Nurses worked with high work stress reported higher fatigue score than nurses with low work stress. ($F = 3.41$, $p <.05$)

Discussion(1)

- **Auricular pressure enhanced sleep quality**
- Consistence with previous studies
- For those who have given some emplanting seeds to press their four points of ear-shenmen, xin, pizhixia and zhen, will be defined as experimental group, and for those who don't need to auricular-acupuncture will be defined as control group.
- Nurses of a regional hospital received auricular acupressure, the score of sleep quality improved from 9.52 to 5.82.

(Wang, Kuo, Lee & Chung, 2005)

Discussion(2)

■ **Auricular pressure enhanced sleep quality**
- ■ control group not receiving any measure.
- ■ experimental group personally affixed by the researchers at Shenmen, heart, endocrine and Subcortex, auricular acupressure posted a time of one ear, maintain seven days, the researchers re-for paste to the other ear the same point, continued for a total six weeks.
- ■ Nurses received auricular acupressure, the score of sleep quality improved from 9.34 to 5.57.

(Chang, Ko, Chang, &Hung, 2010)

Discussion(3)

- **Auricular pressure improved the degree of sleepiness**
- Sleep Hygiene and Sleep Quality of College Students in Southern Taiwan.
- When we grouped the students into "good sleep hygiene" and "bad sleep hygiene", the results showed that students with good sleep hygiene significantly had less degree of sleepiness (ESS: 6.37 ± 2.93 vs. 8.83 ± 3.62, $p<.0l$).
- Sleep quality was highly correlated with the degree of sleepiness.

(Huang, Wu, Chen & Sui, 2009)

Discussion(4)

- **Auricular pressure improved the degree of sleepiness**
- Compared with the global scores defined as good sleeper and normal sleepiness, the sleep quality (t=9.322, p=.000) and sleepiness (t=2.866, p=.005) of male policemen were significantly worse.
- The promotion of sleep quality may result in a decrease on the degree of sleepiness.
  (Huang, Wang, Lin,Chen, Hsu, Chen& Sui, 2008)

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Discussion(5)

- **Auricular pressure reduced the degree of fatigue**
  - Auricular pressure in shenmen point decreased the degree of fatigue in the first stage of labor among primiparous women.

    (Li, 2010)
  - Acupressure intervention **reduced** the degree of fatigue in patients with end-stage renal disease.

    (Cho & Tsay, 2004)

Discussion(6)

■ Nurses with high work stress reported poor sleep quality
  ■ Insomnia of nurses was correlated with work stress, including shift work schedule, cognitive and emotional labor.   (Kuo & Cheng, 2010)
■ Age, seniority, work stress, live in dormitory were highly associated with the degree of sleepiness
  ■ Age and work stress were significantly related to insomnia of hospital personnel.
  ■ 30.9% shift-work reported severe sleepiness in the daytime.   (Wu, 2007)

Discussion(7)

■ Seniority, type of ward and work stress were highly associated with the degree of fatigue
   ■ Staff with less seniority and staff worked in ICU stress experienced greater work stress. And work stress was highly correlated with the degree of fatigue

(Chen, Lee, Tsai & Tsai, 2013)

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Conclusions(1)

- Auricular pressure improved sleep quality and degree of sleepiness, and reduced the degree of fatigue significantly
    - Intervention: 4 weeks
    - Pressure points: Shenmen, Heart, Subcortex, Occiput
- The use of 3M Nexcare acne dressing
    - Less complication of skin allergy and pressure sure
    - Noninvasive and economical
    - High satisfaction

Conclusions(2)

- Courses of auricular acupressure is recommended to be included in the nursing education and clinical training.
- The implication of auricular acupressure should be applied generally to improve sleep quality of nurses and promote safety among patients and nurses.

Acknowledgements

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References(1)

Ayten, D. Z. (2012). Sleep Quality in Shift Workers. *Journal of Sleep Disorders Therapy, 1*(1), 1.

Cho, Y. C., &Tsay , S. L.(2004).The effect of acupressure with massage on fatigue and depression in Patients with End-Stage Renal Disease . *Journal of Nursing Research. 12*(1), 51-59.

Dorrian, J., Paterson, J., Dawson, D., Pincombe, J., Grech, C., & Rogers, A. E. (2011). Sleep, stress and compensatory behaviors in Australian nurses and midwives. *Revista de Saude Publica, 45*(5), 922-930. doi.org/10.1590/S0034-89102011005000059

Flo, E., Pallesen, S., Akerstedt, T., Mageroy, N., Moen, B. E., Gronli, J.,…& Bjorvatn, B. (2013). Shift-related sleep problems vary according to work schedule. *Occupational & Environmental Medicine, 70*(4), 238-45. doi: 10.1136/oemed-2012-101091

Hughes, R., & Rogers, A. E. (2004). Are you tired? Sleep deprivation compromises nurses' health and jeopardizes patients. *American Journal of Nursing, 104*(3), 36-38.

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References(2)

Jeanne, G. B., Alison, T., & Valerie, E. R. (2011). The impact of work schedules, home, and work demands on self-reported sleep in registered nurses. American College of Occupational and Environmental Medicine, 53(3), 303-307. doi: 10.1097/JOM.0b013e31820c3f87

Niu1, S. F., Chung, M. H., Chen, C. H. Hegney, D., O'Brien, A., & Chou, K. R. (2011). The effect of shift rotation on employee cortisol profile, sleep quality, fatigue, and attention level: A systematic review. *Journal of Nursing Research, 19*(1), 68-81.doi: 10.1097/JNR.0b013e31820c1879.

Walsh, J. K. (2004). Clinical and socioeconopmic correlates of insomnia. Journal of Clinical Psychiatry, 65(8), 13-19.

Yeung, W. F., Chung, K. F., Poon, M. M., Ho, F. Y., Zhang, S. P., Zhang, Z. J.,… Wong, V. T.,(2012).Acupressure, reflexology, and auricular acupressure for insomnia: a systematic review of randomized controlled trials.Sleep Medicine. 13(8):971-84.doi: 10.1016/j.sleep.2012.06.003. Epub 2012 Jul 25.

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