

1), 2)

1,2) 2) 2)

Abstract

**Increasing Risk of Mental Health Problems
Among Subway Drivers Experiencing Accidents on the Track**

Jong-Min Woo^{1,2)}, Tae-Young Kang²⁾, Jeong-Eun Lee²⁾

*Department of Neuropsychiatry, Seoul Paik Hospital, Inje University School of Medicine, Seoul¹⁾,
Stress Research Institute, Inje University²⁾*

Objectives: This study examined the prevalence of Post traumatic stress disorder(PTSD) and the comorbidity with panic disorder in subway drivers who experienced accidents on the track. In addition, this study examined the differences in panic disorder, stress levels, work-related problems, and sleep disturbances between drivers with and without an accident-experience.

Methods: 628 Seoul metropolitan subway drivers were participated in this study. We assessed mental health status of the subjects using the Clinician-administered PTSD scale (CAPS), panic disorder scale based on the DSM-IV criteria, Worker 's Stress Response Inventory, and Sleep Questionnaire.

Results: The prevalence of PTSD and comorbid panic disorder was significantly higher among those drivers who had experienced accidents than in those who had not. Drivers with an accident experience showed significantly higher somatic, depressive, anger symptoms in the stress measures, and more sleep problems than those drivers without an accident experience.

Conclusions: The experience of an accident on the track threatens both the work efficiency and the mental health of drivers. In order to reduce the negative effect of an extremely stressful event related to accidents, intervention programs for PTSD and panic disorder need to be developed and utilized.

Key Words: Subway drivers, PTSD, Panic disorder, Stress, Sleep

(Person Under Train, PUT) 가
(Thorell et al, 1994).

. 2003
가 48 2002 24 , ' (Critical Incidence
가 , 가 Stress, CIS) 가 ((, 2004).
34 24 1.4 , 2004. 4. 4). 가

가 . , 466 (38.9%)
가 , 26 (2.3%)
가 , 674 (58.8%)
가 (, 2004).

(train drivers) (subway drivers)
(Post traumatic stress disorder, PTSD) 가 CIS가
76 PTSD ,
1 (Tranah & Farmer, 1994), 17.1%(13)가 PTSD ,
31.6%(24)가 (neurotic depression)
(phobia)
101
(Malt et al, 1993) , 1.
PTSD

(intrusive distress) - 가 50%
1/3
가 (arousal) . 359 , 641 , 13
Theorell (1994) 628
PUT 39.70±6.27
가 3 , 130.49± 67.88 (10 A
1 가 . 11)
가 가 170 (27.1%), B 304
(48.4%), C 154 (24.5%)
가 375 (59.7%)
PTSD (panic disorder) , 253 (40.3%)
, PTSD가

(anxiety sensitivity) (Taylor et al, 1992). 가 PUT , PUT
(David et al, 1995; Falsetti et al, 1995; Silove, 1987). 가 , PTSD

(Markowitz et al, 1989). (Kaplan & Sadock, 1997).

2.
1) (Clinician-Administered PTSD Scale: CAPS)
CAPS 가
Blake (1990) , DSM-III-R
PTSD

(Psychosocial Well-being Index, PWI)

1), A 가 170 104 (61.2%), B 가 304 74.7%(280)
191 (62.8%), C 가 154 80 (52.0%)
. 22 (3.5%) , PTSD 32
628 376 (59.9%) (5.1%) , PTSD
. 30 가 93 9 (1.4%,
(59.2%), 40 가 44 (28.0%) , 2.4%) , PTSD
30 가 104 (47.5%), 40 가 102 (46.6%) 10 (1.6%,
, 30 40 2.7%)
가 가 PTSD
, 34 (13.9%), 211 (86.1%) , 22
42 (11.5%), 321 8 (36.4%) 14
(88.2%) (63.6%) PTSD
40 10 (25.0%)
74 (36.2%) 가 10 30 (75.0%)
10 139 (42.9%) 가
. 3.
2. PTSD
628 515 (82.0%) PTSD 1) WSRI
. (Table 2), t-
92.9%(235)가 가 (Table 3). WSRI

Table 1. General characteristic of participants by accident-experience on the track

		Non-accident-experience	Accident-experience	Total
		Number (%)	Number (%)	Number (%)
Company	A	66 (26.1)	104 (27.7)	170 (27.1)
	B	113 (44.7)	191 (50.9)	304 (48.4)
	C	74 (29.3)	80 (21.3)	154 (24.5)
Age	29	5 (3.2)	4 (1.8)	9 (2.4)
	30~39	93 (59.2)	104 (47.5)	197 (52.4)
	40~49	44 (28.0)	102 (46.6)	146 (38.8)
	50	15 (9.6)	9 (4.1)	24 (6.4)
Marriage	single	34 (13.9)	42 (11.5)	76 (12.5)
	married	211 (86.1)	321 (88.2)	532 (87.4)
	divorce/separation	0 (0.0)	1 (0.3)	1 (0.2)
No. of crewmen riding	1	139 (56.1)	179 (49.2)	318 (52.0)
	2	109 (44.0)	185 (50.8)	294 (48.0)
Job duration (year)	1	7 (3.4)	3 (0.9)	10 (1.9)
	1~2	9 (4.4)	21 (6.5)	30 (5.7)
	3~5	45 (21.7)	65 (20.1)	110 (20.7)
	6~9	71 (34.3)	96 (29.6)	167 (31.6)
	10	75 (36.2)	139 (42.9)	214 (40.3)

5.

(p=0.00).

PTSD 가 , 가 5.0 (Table 6).
 PTSD 가 (1 , 2), , ,

Table 4. Distribution of stress response level by accident experience

	Non-accident-experience	Accident-experience	Total
	Number (%)	Number (%)	Number (%)
Normal	174 (69.6)	215 (57.8)	389 (62.5)
Risk group	49 (19.6)	111 (29.8)	160 (25.7)
Patient level	27 (10.8)	46 (12.4)	73 (11.7)
Total	250 (100.0)	366 (100.0)	616 (100.0)

$\chi^2=9.74, p=0.01$

Table 5. Comparison of sleep problem by accident-experience

	Non-accident-experience	Accident-experience	t	p
	Mean (SD)	Mean (SD)		
Sleep hour	392.29 (57.10)	401.87 (68.47)	-1.86	0.06
Awakening after daytime work	2.33 (0.98)	2.46 (0.89)	-1.61	0.11
Awakening after nighttime work	2.59 (1.07)	2.83 (1.01)	-2.78	0.01
Hypnotic frequency	1.45 (0.89)	1.60 (0.84)	-2.14	0.03
Sleep Habit	2.53 (0.68)	2.59 (0.70)	-1.14	0.25
Depth of sleep	2.69 (1.08)	2.74 (1.06)	-0.50	0.62
Lack of sleep	2.55 (1.11)	2.46 (1.07)	1.07	0.28
Quality of sleep	3.27 (1.10)	3.23 (1.11)	0.39	0.70
Early awakening	2.48 (1.19)	2.58 (1.17)	-0.99	0.32
Sleepiness	2.94 (1.06)	3.06 (1.11)	-1.37	0.17
Snoring	2.26 (1.18)	2.34 (1.12)	-0.94	0.35
Sleep apnea	1.49 (0.91)	1.69 (1.04)	-2.58	0.01
Re-sleep latency	2.55 (1.16)	2.68 (1.17)	-1.43	0.15

Table 6. Logistic regression by general characteristics

reference group	Regression coefficient	Standard error	Odds ratio	95% Confidence interval
Job duration*	-0.001	0.04	0.999	0.992 ~ 1.007
Single	-0.287	0.776	0.751	0.164 ~ 3.437
1 crewman riding	0.700	0.513	2.014	0.738 ~ 5.501
Accident-experience	1.6151	0.504	5.030	1.872 ~ 13.516
Age*	0.092	0.039	1.096	1.016 ~ 1.182

* Job duration Age

가 . 가

2004.

가 2004; 25:193-204.

. 1998.

. 2002. pp318

. THI

2003;13(2):119-25.

2 2004

2004:127-45.

2003;15(1):37-51.

. 2004 4 4

, 2004.

().

가 , 2003.

Blake D, Weathers F, Nagy L, Kaloupek D, Klauminzer G, Charney D, Keane T. Clinician Administered PTSD Scale(CAPS). National Center for Post-Traumatic Stress Disorder, Behavioral science Division-Boston VA, Boston, Mass. 1990.

Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practitioner research. *Psychiatry Res* 1989; 28(2):193-213.

Cothureau C, de Beaurepaire C, Payan C, Cambou J, Rouillon F, Conso F. Professional and medical outcomes for french train drivers after person under train accidents: three year follow up study. *Occup Environ Med* 2004;61:488-94.

David D, Giron A, Mellman TA. Panic-phobic patients and

developmental trauma. *Journal of Clinical Psychiatry* 1995;56:113-7.

Falsetti SA, Resnick HS, Dansky BS, Lydiard RB, Kilpatrick DG. The relationship of stress to panic disorder: Cause or effect: In C. M. Mazure (Ed) *Does stress cause psychiatric illness?* American Psychiatric Press, Washington DC, 1995. pp111-47.

Falsetti SA, Resnick HS, Davis J. Multiple channel exposure therapy: combining cognitive-behavioral therapies for the treatment of posttraumatic stress disorder with panic attacks. *Behav Modif* 2005;29(1):70-94.

Kaplan HI, Sadock BJ. Kaplan and Sadock 's synopsis of psychiatry. 8th ed. Williams & Wilkins, Baltimore Maryland, pp618.

Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M. Eshleman S, et al. Lifetime and 12 month prevalence of DSM-III-R psychiatric disorders in th US: results of the National Comorbidity Study. *Arch Gen Psychiatry* 1994;51:8-19.

Koh KB, Par JK, Kim CH, Cho SH. Development of the stress response inventory and its application in clinical practice. *Psychosomatic Medicine* 2001;63(4):668-78.

Markowitz JS, Weissman MM, Ouellette R, Lish JD, Klerman GL. Quality of life in panic disorder. *Arch Gen Psychiatry* 1989;46:984-92.

Malt UF, Karlehagen S, Hoff H, Herrstromer U, Hildingson K, Tibell E, Leymann H. The effect of major railway accident, *Journal of psychosomatic Research* 1993;37:793-805.

Mitchell J, Everly george S. Critical incident stress management: the basic course workbook. International Critical incident stress foundation, Inc. 1998.

Silove D. Severe threat in the generality of cognitive bias in acute stress disorder. *Behaviour Research and Therapy* 1987;21:592-600.

Taylor S, Koch WJ, McNally RJ. How does anxiety sensitivity vary across the anxiety disorders? *Journal of Anxiety Disorders* 1992;6:24-259.

Theorell T, Leymann H, Jodko M, Konarski K, Norbeck HE. ' Person under train incidents from the subway driver 's point of view-a prospective 1-year follow-up: the desigh, and medical and psychiatric data. *Soc Sci Med*;1994:471-5.

Tranah T, Farmer RD. Psychological reactions of drivers ot railway suicide. *Soc Sci Med* 1994;38(3):459-69.

Watson CG, Juba MP, Manifold V, Kucala T, Anderson P. The PTSD interview : rationale, description, reliability, and concurrent validity of a DSM-III-based technique. *J Clin Psychology* 1991;47:179-88.