EFFECT OF THE ROLE OF SAFETY OFFICER ON COMPLIANCE TO OCCUPATIONAL SAFETY AND HEALTH (OSH) AMONG OUTSOURCING WORKERS IN COMPANY X, SURABAYA

Noeroel Widajati, Meirina Ernawati, Tri Martiana

Faculty of Public Health, Airlangga University

ABSTRAK

Hingga akhir tahun 2012, Jamsostek menunjukkan adanya 103.074 kasus kecelakaan kerja. 91,21% dari jumlah korban kecelakaan dapat kembali sembuh, 3,8% mengalami cacat fungsi, 2,61% mengalami cacat sebagian, dan sisanya meninggal dunia (2.419 kasus) dan mengalami cacat total tetap (37 kasus), dengan rerata 282 kasus kecelakaan kerja setiap harinya. Karena pengaruh iklim perusahaan yang semakin ketat, perusahaan berusaha untuk melakukan efesiensi biaya produksi (cost of production). Salah satu solusi yang dapat diambil adalah dengan penerapan sistem outsourcing. Dengan sistem ini, perusahaan dapat menghemat pengeluaran dalam membiayai sumber daya manusia (SDM) yang bekerja di perusahaan bersangkutan. Apabila aspek penerapan Keselamatan dan Kesehatan Kerja (K3) tidak dikelola dengan benar, maka kemungkinan terjadinya kecelakaan kerja dan pencemaran lingkungan yang mempunyai pengaruh negatif terhadap citra perusahaan dan kelancaran persediaan produk perusahaan akan meningkat. Hal ini akan berdampak pada kerugian perusahaan, baik materi maupun citra perusahaan. Peran dan tanggung jawab safety officer sangat berpengaruh terhadap tercapainya zero accident, sehingga banyak program safety yang dikembangkan, antara lain safety briefing dan safety patrol, dengan tujuan untuk meningkatkan aspek K3. Namun, beberapa karyawan yang belum mentaati ketentuan dari penerapan K3 di perusahaan tempat mereka bekerja. (FMI 2017;53:131-138)

Kata kunci: outsourcing, peran safety officer, kepatuhan

ABSTRACT

Up to the end of 2012, Social Security showed the occurence of 103.074 work accident cases. 91.21% of the accident casualties were recovered, 3.8% were disabled, 2.61% partially disabled, and the rest died (2.419 cases) and were totally-permanently disabled (37 cases), with the average of 282 work accident cases per day. Due to the increasingly tight corporate climate, the company tries to make production cost efficiency (cost of production). One solution that may be taken is by applying outsourcing system. With this system, the company may save expenses in funding human resources (HR) who work in the company concerned. If the aspects of the application of Occupational Safety and Health (OSH) are not properly managed, the possibility of work accidents and environmental pollution that have a negative effect on the corporate image and the continuity of company product supply will increase. This may affect the company's loss, both material and corporate image. The role and responsibility of the safety officer is very influential on the achievement of zero accident, so many safety programs are developed, such as safety briefing and safety patrol, with the aim to improve the aspect of OSH. However, some employees have not complied with the provisions of OSH implementation in the company they work at. (FMI 2017;53:131-138)

Keywords: outsourcing, role of safety officer, compliance

Correspondence: Noeroel Widajati, Faculty of Public Health, Universitas Airlangga.

E-mail: noeroel2014@yahoo.co.id

INTRODUCTION

The International Labor Organization (ILO) stated that every year in the world, 2 million people die as a result of occupational accidents. Every year, 270 million workers have work-related accidents, and 160 million are affected by occupational diseases. The cost to overcome the problem is enormous. The ILO estimated the losses incurred due to accidents and occupational diseases each year are more than US \$ 1.25 trillion or equal to 4% of Gross Domestic Product (GDP). Due to the increasingly tight corporate climate, the companies try to make production cost efficiency (cost of

production). One solution that may be taken is by applying outsourcing system. With this system, the companies may save expenses in funding human resources (HR). Corporate image is determined by several factors, one of which is the companies' way of managing aspects of Health, Safety and Environment (HSE) or Safety Officer.

If the aspects of the application of Occupational Safety and Health (OSH) are not properly managed, the possibility of work accidents and environmental pollution will increase. This may have negative effect on the corporate image and the continuity of company product supply. Occupational Safety and Health Program in the company is advantageous as guidelines and direction for the implementation of work, from the production to the warehouse, in order to avoid the hazard and risk of occupational accidents. Therefore, the companies may obtain proper product quality results which are in accordance with the requirements of safe conditions.

Safety officer is responsible for ensuring effective implementation of work safety started from planning, implementing, reporting, up to following-up. The role and responsibility of the safety officer is very influential in the achievement of zero accident. Therefore, many safety programs are developed, such as safety briefing and safety patrol, with the aim to improve the aspect of OSH. However, some employees have not complied with the provisions of OSH implementation in the company they work at (Widajati 2015).

MATERIALS AND METHODS

This was an analytic study using observational method since the researchers only performed observation and measurement without providing treatment or interaction to the respondents. This study used cross sectional method because the observation and measurement of independent and dependent variables were combined and implemented simultaneously in a short time. This study aimed to analyze the effect of safety officer's role on OSH compliance in outsourced workers. This study was conducted on 50 production department workers in Company X Surabaya.

RESULTS

Respondents' characteristics

This study was conducted on 50 production workers. The characteristics of the respondents are shown in Table 1.

Fabrication division respondents of Company X were 50 persons, mostly had high school education level of 40 persons (80.00%), and only one person (1.00%) had elementary education level. The level of respondents' education was adequate, which was high school and equal, even there were 4 persons (8.00%) with diploma or bachelor degree. The working period of respondents was mostly in the range of less than 1 year to 7 years, comprising 35 persons (70.00%), while the least was those in working period of more than 21 years. The respondents' age was in young adult age-group ranging from 21 to 30 years as many as 32 persons (64.00%), while the age range of more than 50 years were only 2 persons (4.00%). The fabrication division requires a large level of physical strength, thus, it mostly needs young-age workers. The result of OSH training experience showed that most respondents in fabrication division of Company X had not received OSH training, which was 28 persons (44.00%). This OSH training is related to the introduction of hazard risk in the workplace so that workers may make efforts to prevent occupational accidents and diseases independently.

Table 1. Characteristics of the respondents, steel construction workers in production division (n=50)

No	Subjects'			Freq.	Percentage
INO	Characteristics			(f)	(%)
1.	Education	a.	Primary school	1	2.00
		b.	Junior high school	5	10.00
		c.	Senior high school	40	80.00
		d.	Diploma/bachelor degree	4	8.00
2.	Work period	a.	<1-7 years	35	70.00
		b.	>7 – 14 years	10	20.00
		c.	>14 – 21 years	3	6.00
		d.	>21 years	2	4.00
3.	Age	a.	21 - 30 years old	32	64.00
		b.	31 – 40 years old	10	2.00
		c.	41 – 50 years old	6	12.00
		d.	> 50 years old	2	4.00
4.	OSH training	a.	Ever	22	56.00
	experience	b.	Never	28	44.00
		Tot	al	50	100.00

Table 2. Correlation between safety briefing and compliance of work rules

				Complianc	e of Work	Rules		
Safety Briefing	Ne	ver	Almo	st Never	Highly Frequent		Almost Frequer	
	n	%	n	%	n	%	n	%
Never	0	0	1	6.67	1	3.7	1	12.5
Almost Never	0	0	3	20	9	33.33	0	0
Highly Frequent	0	0	9	60	13	48.15	4	50
Almost Frequent	0	0	2	13.33	4	14.82	3	37.5
Total	0	0	15	100	27	100	8	100

Table 3. Correlation between safety briefing and SOP compliance

				SOP co	ompliance			
Safety Briefing	Ne	ever	Almost Never Highly Fre		Frequent	t Almost Freq		
	n	%	n	%	n	%	N	%
Never	1	100	0	0	0	0	2	9.52
Almost Never	0	0	2	40	6	26.09	4	19.05
Highly Frequent	0	0	3	60	14	60.87	9	42.86
Almost Frequent	0	0	0	0	3	13.04	6	28.57
Total	1	0	5	100	23	100	21	100

Table 4. Correlation between safety briefing and SPD compliance

				SPD C	ompliance	2		
Safety Briefing	Ne	ver	Almost Never		Highly	Frequent	Almost Freque	
	n	%	N	%	n	%	n	%
Never	0	0	1	20	0	0	2	8.7
Almost Never	0	0	3	60	6	27.27	3	13.04
Highly Frequent	0	0	1	20	13	59.09	12	52.17
Almost Frequent	0	0	0	0	3	13.64	6	26.09
Total	0	0	5	100	22	100	23	100

Table 2 shows that the safety briefing was conducted every day before the beginning of work, and most respondents had high frequency of OSH compliance, as many as 27 persons (54.00%) out of 50 respondents. There were 15 persons (30.00%) who rarely applied OSH and 8 persons (16.00%) who always complied with OSH regulations. This table shows that there were still many respondents who rarely complied with OSH regulations. The result of regression statistic test between safety briefing and OSH compliance showed the significance of $0.607 > \alpha$ indicating no correlation between safety briefing and OSH compliance.

Table 3 shows that respondents who had high frequency of SOP compliance with high frequency safety briefing were 60.87%, while those who had high frequency of SOP compliance with high frequency of safety briefing were 13.04%. The result of regression statistic test between safety briefing and SOP compliance showed the significance of $0.066 > \alpha$ indicating no correlation bet-

ween safety briefing and SOP compliance. Table 4 shows that respondents who had high frequency of SPD compliance with high frequency safety briefing were 59.09%, while those who had high frequency of SPD compliance with almost frequent safety briefing were 8.7%. The result of regression statistic test between safety briefing and SPD compliance showed the significance of $0.049 > \alpha$ indicating no correlation between safety briefing and SPD compliance.

Table 5 shows that the respondents who had high frequency of work rule compliance with high frequency of safety induction were 62.5%, while those who had high frequency of work rule compliance with low frequency of safety induction were 12.5%. The result of regression statistic test between safety induction and work rule compliance showed the significance of $0.665 > \alpha$ indicating no correlation between safety briefing and SPD compliance.

Table 5. Correlation between safety induction and compliance of work rules

			(Compliance	of Work	Rules		
Safety Induction	Ne	Never		Almost Never		y Frequent	Almost Frequen	
	n	%	n	%	n	%	n	%
Never	0	0	1	6.67	1	3.7	0	0
Almost Never	0	0	9	60	1	3.7	1	12.5
Highly Frequent	0	0	4	26.66	15	55.56	2	25
Almost Frequent	0	0	1	6.67	10	37.04	5	62.5
Total	0	0	15	100	27	100	8	100

Table 6. Correlation between safety induction and SOP compliance

				SOP C	ompliance	e		
Safety Induction	Ne	Never		Almost Never		Highly Frequent		t Frequent
	n	%	n	%	n	%	n	%
Never	0	0	1	20	0	0	1	4.77
Almost Never	1	100	2	40	6	26.09	2	9.52
Highly Frequent	0	0	1	20	13	56.52	7	33.33
Almost Frequent	0	0	1	20	4	17.39	11	52.58
Total	0	100	5	100	23	100	21	100

Table 7. Correlation between safety induction and SPD compliance

				SPD Co	ompliance	e		
Safety Induction	Ne	ver	Almos	st Never	Highly Frequent		Almost Frequent	
	N	%	n	%	n	%	n	%
Never	0	0	0	0	1	4.55	1	4.35
Almost Never	0	0	2	40	6	27.27	3	13.04
Highly Frequent	0	0	2	40	11	50	8	34.78
Almost Frequent	0	0	1	20	4	18.18	11	47.83
Total	0	0	5	100	22	100	23	100

Table 6 shows that the respondents who had high frequency of SOP compliance with high frequency of safety induction were 56.52%, while those who never obeyed to SOP with high frequency of safety induction were 4.77%. The result of regression statistic test between safety induction and SOP compliance showed the significance of $0.607 > \alpha$ indicating no correlation between safety induction and SOP compliance. Table 7 shows that the respondents who had high frequency of SPD compliance with high frequency of safety induction were 47.83%, while those who had high frequency of SPD compliance with low frequency of safety induction were 4.35%. The result of regression statistic test between safety induction and SPD compliance showed the significance of $0.012 > \alpha$ indicating no correlation between safety induction and SPD compliance.

Table 8 shows that the respondents who had high frequency of work rule compliance with high frequency of safety talk were 75%, while those who had high frequency of work rule compliance with low frequency of safety talk were 11.11%. The result of regression

statistic test between safety talk and compliance of work rules showed the significance of $0.615 > \alpha$ indicating no correlation between safety talk and compliance of work rules. Table 9 shows that the respondents who had high frequency of SOP compliance with high frequency of safety talk were 69.57%, while those who never obeyed to SOP with low frequency of safety talk were 100%. The result of regression statistic test between safety talk and compliance of SOP showed the significance of 0.155>α indicating no correlation between safety talk and SOP compliance. Table 10 shows that the respondents who had high frequency of SPD compliance with high frequency of safety talk were 68.18%, while those who had high frequency of SPD compliance with low frequency of safety talk were 8.7%. The result of regression statistic test between safety talk and compliance of SPD showed the significance of $0.082 > \alpha$ indicating no correlation between safety talk and SPD compliance.

Table 8. Correlation between safety talk and compliance of work rules

			(Compliance	of Work	Rules		
Safety Talk	Ne	ever	Almo	st Never	Highly Frequent		Almost Frequent	
	n	%	n	%	n	%	n	%
Never	0	0	0	0	0	0	0	0
Almost Never	0	0	4	26.67	3	11.11	0	0
Highly Frequent	0	0	9	60	14	51.85	2	25
Almost Frequent	0	0	2	13.33	10	37.04	6	75
Total	0	100	15	100	27	100	8	100

Table 9. Correlation between safety talk and SOP compliance

				SOP Co	mpliance	;		
Safety Talk	Ne	ever	Almo	st Never	Highly Frequent		Almost Frequent	
	n	%	n	%	n	%	n	%
Never	0	0	0	0	0	0	0	0
Almost Never	1	100	1	20	4	17.39	1	4.76
Highly Frequent	0	0	3	60	16	69.57	6	28.57
Almost Frequent	0	0	1	20	3	13.04	14	66.67
Total	0	100	5	100	23	100	21	100

Table 10. Correlation between safety talk and SPD compliance

				SPD Co	ompliance	e		
Safety Talk	Ne	ver	Almos	st Never	Highly Frequent		Almost Frequent	
	n	%	n	%	n	%	n	%
Never	0	0	0	0	0	0	0	0
Almost Never	0	0	1	20	4	18.18	2	8.7
Highly Frequent	0	0	3	60	15	68.18	7	30.43
Almost Frequent	0	0	1	20	3	13.64	14	60.87
Total	0	0	5	100	22	100	23	100

Table 11. Correlation between safety patrol and compliance of work rules

			(Compliance	of Work	Rules		
Safety Patrol	Ne	ever	Almo	st Never	Highly Frequent		Almost Frequent	
	n	%	n	%	n	%	n	%
Never	0	0	0	0	0	0	0	0
Almost Never	0	0	4	26.67	4	14.81	0	0
Highly Frequent	0	0	8	53.33	16	59.26	1	12.5
Almost Frequent	0	0	3	20	7	25.93	7	87.5
Total	0	100	15	100	27	100	8	100

Table 12. Correlation between safety patrol and SOP compliance

				SOP	Complia	nce		
Safety Patrol	Ne	ever	Almost Never		Highl	y Frequent	Almost Frequent	
	n	%	n	%	N	%	n	%
Never	0	0	0	0	0	0	0	0
Almost Never	0	0	2	40	4	17.39	2	9.52
Highly Frequent	1	100	3	60	16	69.57	5	23.81
Almost Frequent	0	0	0	0	3	13.04	14	66.67
Total	1	100	5	100	23	100	22	100

Safety Patrol	SPD Compliance							
	Never		Almost Never		Highly Frequent		Almost Frequent	
	n	%	n	%	n	%	n	%
Never	0	0	0	0	0	0	0	0
Almost Never	0	0	2	40	4	18.18	2	8.7
Highly Frequent	0	0	3	60	16	72.73	6	26.09
Almost Frequent	0	0	0	0	2	9.09	15	65.21
Total	0	0	5	100	22	100	23	100

Table 13. Correlation between safety patrol and SPD compliance

Table 11 shows that the respondents who had high frequency of work rule compliance with high frequency of safety patrol were 87.5%, while those who had high frequency of work rule compliance with high frequency of safety patrol were 12.5%. The result of regression statistic test between safety patrol and work rule compliance showed the significance of $0.642 > \alpha$ indicating no correlation between safety patrol and work rule compliance.

Table 12 shows that the respondents who had high frequency of SOP compliance with high frequency of safety patrol were 69.57%, while those who had high frequency of SOP compliance with low frequency of safety patrol were 9.52%. The result of regression statistic test between safety patrol and SOP compliance showed the significance of $0.156 > \alpha$ indicating no correlation between safety patrol and SOP compliance. Table 13 shows that the respondents who had high frequency of SPD compliance with high frequency of safety patrol were 72.73%, while those who had high frequency of SPD compliance with low frequency of safety patrol were 8.7%. The result of regression statistic test between safety patrol and SPD compliance showed the significance of $0.127 > \alpha$ indicating no correlation between safety patrol and SPD compliance.

DISCUSSION

Correlation between safety briefing and compliance of work rules

Safety briefing is one of the tasks undertaken by the safety officer which is performed before the outsourced worker starts his/her work. Safety briefing describes job procedures, possible hazards and risks, and identifies all job requirements. Safety briefing should have significant relationship with labor compliance related to OSH. Based on the results of research conducted on outsourced workers at Company X, there were still many workers who rarely adhered to OSH regulations, even though safety briefing was done frequently. This means that safety briefing may not be a factor asso-ciated with

labor compliance with OSH rules. This is in line with Hidayat's (2007) study which stated that there was no relationship between safety briefing and laboratory OSH compliance.

Correlation between safety briefing and SPD compliance

The results of the study conducted at Company X proved that there was a significant correlation between safety briefing and the compliance of SPD use. According to Bisen and Priya (2010), training is a learning process that increases knowledge, ability, regulation or changes behavior to improve job performance. Training is usually provided at the time of brefing aimed at making the workers to get information about SPD and behave in a obedient manner in using SPD. However, this is not in line with Marina and Kartika's (2017) study which stated that OSH training during safety briefing did not have a significant effect on the use of SPD.

Correlation between safety briefing and SOP compliance

SOP is a written standard/guideline used to encourage and mobilize a group to achieve organizational goals. SOP is standardized procedure or stage which has to be carried out to complete particular work process (Perry and Potter, 2005). The study conducted at Company X showed no significant correlation between safety briefing and SOP compliance. The existence of safety briefing may increase the workers' knowledge of the job's SOP. However, this is not in line with the study by Ginanjar (2006) which states a significant correlation between knowledge and SOP compliance.

Correlation between safety induction and compliance of work rules

Safety induction is a part of OSH that is carried out and performed at any time and circumstances, or in work-place that has more risky conditions, as well as in any conditions in workplace. Safety induction is also implemented as a notice for workers or newcomers. The

study at Company X showed that there was no significant correlation between safety induction and compliance with work rules. However, it is not in accordance with Angelina's (2010) study which stated that the existence of safety induction in the workplace affected the work rules.

Correlation between safety induction and SPD compliance

The existence of safety induction conducted by safety officer provides knowledge about OSH to workers or newcomers in the workplace. The increasing knowledge about OSH on workers is expected to make the workers have safety behavior. Table 7 shows that the workers who almost fully adhered using SPD because of frequently receiving safety induction had fairly higher percentage. The result of study at Company X proved a significant correlation between safety induction and SPD compliance. Nevertheless, this is not in accordance with the study by Hastanti (2004) which stated that there was no correlation between the knowledge gained from safety induction and SPD compliance.

Correlation between safety induction and SOP compliance

The existence of safety induction will increase workers' knowledge of SOP at work. The study result at Company X showed that there was no significant correlation between safety induction and SOP compliance. However, it is not in line with the study by Ginanjar (2006) which stated that there was a significant relationship between knowledge gained from safety induction and SOP compliance. The insignificant results of the study may be because the respondents in this study had received adequate safety briefing but did not apply safe working behavior and apparently negative effects did not happen to them. Therefore, they were not encouraged to apply safe and healthy behavior.

Correlation between safety talk and compliances of work rules, SOP, and SPD

Safety talk is a routine meeting conducted for employees or workers and supervisors or HSE to discuss about OSH. Safety talk is one of the supporting means in preventing the occurrence of hazards in workplace, and may improve the worker's knowledge of encountered work, the dangers that may exist along with the prevention. The knowledge is one of the factors in the person component of safety triad theory that will affect compliance (Geller 2001). The existence of safety talk should make the workers more obedient to the work rules since the safety talk itself contains information

related to SOP and job safety analysis. The study indicated that there was no significant correlation between safety talk and compliance of work rules, SOP, and SPD. This non-compliance may be due to several factors such as an internal factor of an individual who felt that he or she understood the job well even if the work was not in accordance with the rules. It may be because the individual felt secure even if they did not use SPD or work based on SOP.

Correlation between safety patrol and compliance of work rules, SOP, and SPD

Safety patrol is a patrol activity towards the implementation of HSE in all areas by the personal manager along with union representative. The inspection area covers all areas of the factory. The effectiveness of corrective action in patrol findings is monitored by SHE Department. The patrol results will be reported in SHE meeting. The existence of safety patrol usually results in the finding of non-compliant workers, so it is expected that if there is safety patrol, the workers are more obedient to the rules of work, SOP, and the use of personal protective equipment. According to Rini's (2010) study, safety patrol had a significant correlation with labor compliance towards SPD. This is in contrast to the study result at Company X which stated that there was no correlation between safety patrol with compliance of work rules, SOP, and SPD.

CONCLUSION

The education level of the respondents' was adequate, which was high school and equal, even some of them had diploma or bachelor degree. The result of OSH training experience showed that most of the respondents in fabrication division of Company X had never received OSH training. This OSH training is related to the introduction of occupational hazards and risks, therefore, workers may make efforts to prevent occupational accidents and diseases independently. Respondents had received a good safety briefing, but they did not apply safe working behavior. Nevertheless, no negative outcome occurred, so the respondents were not encouraged to have healthy and safe working behavior. In addition to SOP compliance, respondents were mostly very adherent to APD. As for the compliance of work rules, most respondents almost always adhered to them. The respondents almost always adhered to work rules with safety induction. In addition, some respondents also adhered to SOP and performed APD compliance. The respondents had almost high level of compliance to work rules, had high level of compliance to SPD, and moderate level of compliance to SOP.

REFERENCES

- Angelina K (2010). Gambaran upaya penerapan safety behavior di area workshop PT. Trakindo Utama. Thesis. Universitas Sebelas Maret, Surakarta
- Bisen V & Priya (2010). Industrial psychology, New Delhi: New Age International
- Depnakertrans (2013).Undang-Undang Ketenagakerjaan Tahun 2013. Jakarta
- Geller ES (2001). The psychology of safety handbook. Boca Raton, Lewish Publisher
- Ginanjar A (2006). Faktor-faktor yang berhubungan dengan kepatuhan petugas imunisasi terhadap standar operasional prosedur imunisasi di Kabupaten Lebak tahun 2006. Thesis, Universitas Indonesia, Depok
- Hastanti R (2004). Faktor yang berhubungan dengan pemakaian APD pada pekerja konstruksi bangunan. Thesis, Airlangga University, Surabaya
- Hidayat ER (2007). Komponen-komponen yang menunjukkan komitmen K3 pada pengelolaan K3Di TPA Galuga Bogor tahun 2007. Thesis, Universitas Indonesia, Depok
- ILO (1997), Encyclopaedia of Occupational Health and Safety, Geneva, Switzerland

- Jamsostek (2010). Tingkat Kecelakaan Kerja Masih Tinggi. Available from http://www.jamsostek.co.id/content/news.php?id=1031. Accessed January 20, 2011
- Marina, Kartika KA (2017). Evaluasi kinerja keselamatan dan kesehatan kerja pembangunan retaining wall pada proyek jembatan Sembayat Baru II Kabupaten Gresik. Thesis, Institut Teknologi Sepuluh Nopember, Surabaya
- Potter PA, Perry AG (2005). Buku Ajar Fundamental Keperawatan: Konsep, Proses, dan Praktik. 4 eds. Volume 1. Translated by: Yasmin Asih et al. Jakarta, EGC
- Potter PA, Perry AG (2005). Buku Ajar Fundamental Keperawatan: Konsep, Proses, dan Praktik. 4th eds. Volume 2. Translated by: Renata Komalasari et al. Jakarta, EGC
- Rini AI (2010). Implementasi Patrol SHE dan 5M dengan metode *STOP SIX* untuk mencegah kecelakaan kerja di PT. Denso Indonesia. Thesis, Universitas Sebelas Maret, Surakarta
- Widajati N (2015). Pengembangan model NIOSH tentang unsafe action akibat job stress pada pekerja bagian produksi di perusahaan konstruksi baja. Dissertation. Airlangga University, Surabaya