

## Measuring of Worker Consciousness Levels at Construction Sites in Vietnam and Korea

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**Abstract:** As is well known, there are certain economic, cultural and historical differences between Vietnam and Korea. These differences create some variances in the consciousness of the people, particularly workers at construction sites. Consciousness, particularly safety consciousness is the most important factor related to ensuring safety at construction sites. Many possible factors related to these issues will be considered in this study. They will be statistically analyzed after more than 100 questionnaire survey sheets are distributed to workers at construction sites of six major cities in Korea and Vietnam. Worker's awareness of penalty-related regulations such as the actual penalties their level of understanding, their obligations with regard to HSE, the advice of safety managers about penalties, the correlation between the issuance of a penalty and ensuring safety at construction sites and the level of awareness of penalties were also, considered in this study. It shows that more than 70% of Korean workers do not agree to the issuing of penalties at construction sites. On the other hand, Vietnamese workers agree to pay some penalty for violating HSE regulations which should be followed at construction sites but they do not want to pay it themselves, i.e., out of their own pay.

**Key words:** Consciousness level, Vietnam and Korea, constructions sites, correlation analysis, penalties, violating

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### INTRODUCTION

The Korea government and the Vietnam government have engaged in active mutual exchanges in various areas over the last decade and up to the present. KOICA also has a good relationship with the Vietnam government in supporting safety matters in Vietnam through KOSHA an organization under the Ministry of Employment and Labor in Korea. The Vietnamese government is currently making an effort to establish basic Health and Safety Enforcement regulations (HSE) (Bae, 2010). It is well-known that there are certain economic, cultural and historical differences between Vietnam and Korea. These differences create some variances in the consciousness of citizens, particularly workers at construction sites (Korkmaz and Park, 2018). Consciousness, particularly safety consciousness is the most important factor related to ensuring safety at construction sites (Lee and Sang, 2016; Yuan, 2013).

Therefore, this consciousness matter given its connection to accidents should be improved and decreased (Griffin and Neal, 2000). Furthermore, the

differences between two countries given their different cultures and consciousness level can be very useful factors related to accidents and safety which are continuing concerns. Many possible factors related to these issues will be considered in this study.

We statistically analyzed after more than 100 questionnaire survey sheets were distributed to workers at construction sites of 6 major cities in Korea and Vietnam.

### MATERIALS AND METHODS

The level of conscientious compliance with the laws on the occupational safety and health of workers working at construction sites in South Korea is much higher than that by these workers in Vietnam. This means that training systems for occupational safety and health in Korea are better communicated to employees. These systems are very good and operated efficiently.

Furthermore, legal remedies and administrative penalties for violations of legislation pertaining to occupational safety and health in Korea are higher and

heavier than those of Vietnam. For example, in the documented regulations affecting administrative penalties against violations of legislation pertaining to occupational safety and health of Vietnam at present, the government only punishes employers when their employees violate these laws at construction sites. Employers also can penalize their employees when they violate HSE laws and rules at construction sites.

All of the survey sheets were distributed in six regional areas in Vietnam and six others in Korea to avoid large deviations due to possible prejudice stemming from the use of only one construction site. General information about the respondents such as their age, smoking condition, drinking condition, health, work type, work experience, salary and educational background were included on the surveys.

Worker’s awareness of penalty-related regulations such as the actual penalties, their level of understanding, their obligations with regard to HSE the advice of safety managers about penalties, the correlation between the issuance of a penalty and ensuring safety at construction sites and the level of awareness of penalties were also, considered in this study.

Frequency, variance and correlation analyses were conducted to find significant statistically items to compare each critical result in the study.

**RESULTS AND DISCUSSION**

**Vietnam case**

**Analysis of frequency:** The experience of the workers represents one of the most relevant factors in the study. In this case, 22.98% had <5 years 42.86% reported 6~10 years and 14.91% had 11~15 years. Educational background was also, a highly relevant factor. The consciousness of workers is directly related to this. Regarding education, 13.4% had a high school education, 42.24% reported that had graduated from college and 32.92% had graduated from university, shown in Table 1.

The correlation between a worker’s experience level and their level of understanding of their duties at construction sites was also, reviewed with a proper technique. This correlation factor was 0.331 with a p value of 0.000, meaning that there is a significant correlation, i.e., the more experience a worker has the better they know their duties, shown in Table 2 and 3.

**Analysis of variance:** Many of the respondents are involved in the following six types of work: concrete work, scaffolding work, electrical work, plumbing work, steel work and form work. An analysis of variance was done to find, if there were certain differences in the average

values. It was found that there were no significant differences in these values, shown in Fig. 1. Pooled standard deviation is used for calculating interval value.

Table 1: Result of frequency analysis, Vietnam

Question/Answers	Frequencies	Percentage
<b>Your work type</b>		
Welding	41	25.47
Con’c/scaffold	21	13.04
Plumbing	20	12.42
Steel frame	17	10.56
Mold/woodworking	14	8.70
Civil	9	5.59
Worker (labor)	4	2.48
Painting	8	4.97
Electricity	17	10.56
Etc.	10	6.21
<b>Your work experience (years)</b>		
less 5	37	22.98
6-10	69	42.86
11-15	24	14.91
16-20	16	9.94
20 more	15	9.32
<b>Your monthly salary average (unit:USD)</b>		
less \$1,000	161	100.00
\$1,000-1,500	0	0.00
\$1,500-2,000	0	0.00
\$2,000-2,500	0	0.00
\$2,500 over	0	0.00
<b>Your educational background</b>		
Elementary school	0	0.00
Middle school	0	0.00
High school	21	13.04
College	68	42.24
University or more	53	32.92

Table 2: Result of correlation analysis

Variables	Experiences	B2
<b>Experiences</b>		
Pearson correlation factor	1.000	0.331**
Significance probability (both side)	-	0.000
N	161.000	161.000
<b>B2</b>		
Pearson correlation factor	0.331**	1.000
Significance probability (both side)	0.000	-
N	161.000	161.000

\*Significant values

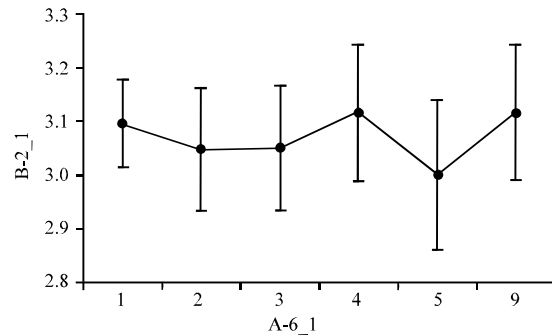


Fig. 1: Result of analysis of Variance, Vietnam (Section graph of B-2\_1 95% CI a bone average): 1) Welding; 2) Con’c/scaffolding; 3) Plumbing; 4) Steel; 9) Form worker and 6) Electricity work

Table 3: Result of correlation analysis

Variables	Experiences	C2	C4	C7	C8	C9
<b>Experiences</b>						
Pearson correlation factor	1.000	0.303**	0.062	0.218**	0.238**	0.210**
Significance probability (both side)		0.000	0.433	0.005	0.002	0.008
N	161.000	161.000	161.000	161.000	161.000	161.000
<b>C2</b>						
Pearson correlation factor	0.303**	1.000	0.321**	0.453**	0.393**	0.474**
Significance probability (both side)	0.000		0.000	0.000	0.000	0.000
N	161.000	161.000	161.000	161.000	161.000	161.000
<b>C4</b>						
Pearson correlation factor	<b>0.062</b>	0.321**	1.000	0.392**	0.233**	0.187*
Significance probability (both side)	0.433	0.000		0.000	0.003	0.018
N	161.000	161.000	161.000	161.000	161.000	161.000
<b>C7</b>						
Pearson correlation factor	0.218**	0.453**	0.392**	1.000	0.727**	0.628**
Significance probability (both side)	0.005	0.000	0.000		0.000	0.000
N	161.000	161.000	161.000	161.000	161.000	161.000
<b>C8</b>						
Pearson correlation factor	0.238**	0.393**	0.233**	0.727**	1.000	0.780**
Significance probability (both side)	0.002	0.000	0.003	0.000		0.000
N	161.000	161.000	161.000	161.000	161.000	161.000
<b>C9</b>						
Pearson correlation factor	0.210**	0.474**	<b>0.187*</b>	0.628**	0.780**	1.000
Significance probability (both side)	0.008	0.000	0.018	0.000	0.000	
N	161.000	161.000	161.000	161.000	161.000	161.000

\*\*Correlation factor is significant with 0.01 level (bold values are significant)

Table 4: Result of frequency analysis, Korea

Question/Answers	Frequencies	Percentage
<b>Your work type</b>		
Welding	17	17
Con`c/scaffold	14	14
Plumbing	23	23
Steel frame	15	15
Mold/woodworking	12	12
Civil	7	7
Worker (labor)	4	4
Painting	2	2
Electricity	3	3
etc	3	3
<b>Your work experience (years)</b>		
less 5	14	14
6-10	33	33
11-15	41	41
16-20	9	9
20 more	3	3
<b>Your monthly salary (average) (unit:USD)</b>		
less \$1,000	2	2
\$1,000-1,500	12	12
\$1,500-2,000	29	29
\$2,000-2,500	12	12
\$2,500 over	45	45
<b>Your educational background</b>		
Elementary school	3	3
Middle school	16	16
High school	57	57
college	22	22
University or more	2	2

**Korea case**

**Analysis of frequency:** Workers who do not undergo health checks who enter construction machinery operation areas without authorization and who neglect signal notices should be penalized but it was noted that

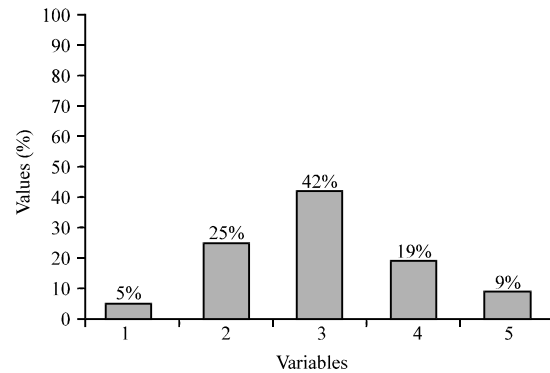


Fig. 2: Result of questionnaire; Do you think that the imposition of penalties will help to guarantee worker’s safety on construction sites; 1) No, 2) Do not know, 3) Perhaps, 4) Yes, it could help and 5) Indifferent

more than 70% of all respondents considered this to be unreasonable. This penalty-denying mindset could be a cause of accidents in the future, Table 4 and Fig. 2-4.

**Analysis of correlation:** The correlation between a worker’s level of experience and their level of understanding of their duty at construction sites was reviewed. It was found that the correlation factor in this case is 0.080, for a p value of 0.428, indicating the absence of a significant correlation. Thus, more experience in a worker is not correlated with their level of understanding of their duties, shown in Table 5 and 6.

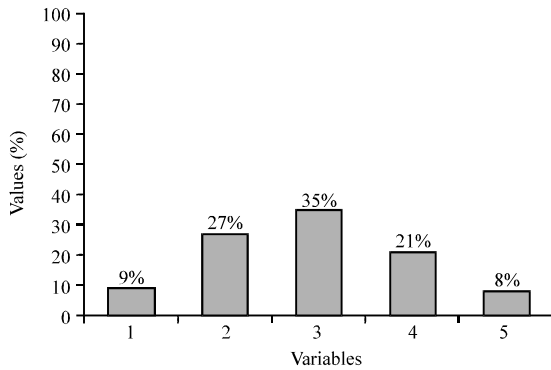


Fig. 3: Result of questionnaire; If you violate regulations and receive a penalty will you pay it your self straightaway: 1) No, 2) Do not know, 3) Yes, 4) Will ask to Company and 5) Indifferent

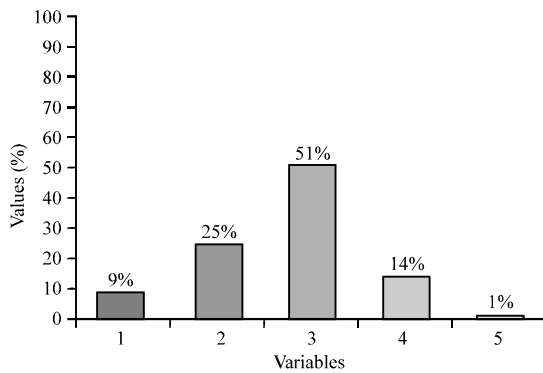


Fig. 4: Result of questionnaire; Do you think it is reasonable for the Government to fine a \$50 penalty for the first offence, \$100 for the second offence and \$150 for the third offence when workers do not follow the OSHA regulations according to which workers must follow the rules made by their employer according to the Ministry of Employment and Labor Act (Articles 23, 24, 38) 1) Very unfair 2) Unfair 3) Unsure 4) Right and 5) Absolutely right

**Analysis of variance:** According to, the results there were no significant differences in terms of penalty recognition by work type except for plumbing workers who recognized that the penalty level may be reasonable.

**Analysis:** It is shown that the safety consciousness of workers at construction sites is not greatly influenced by their level of experience. This was found by both an analysis of variance and a correlation analysis. All of the workers at the construction sites in Vietnam replied with

Table 5: Result of correlation analysis, Korea

Variables	Experiences	B2
<b>Experiences</b>		
Pearson correlation factor	1.000	0.080
Significance probability (both side)	-	0.428
N	100.000	100.000
<b>B2</b>		
Pearson correlation factor	0.080	1.000
Significance probability (both side)	0.428	-
N	100.000	100.000

\*\*Correlation factor is significant with 0.01 level

the answer “ Will ask the company ” when presented a hypothetical scenario in which they violated HSE regulations and must pay a penalty, thus, hoping not to have to pay it themselves. Social and economic levels could be closely related to having a reasonable mindset about this.

An initial fine of USD 100 a second fine of USD 200 and a third fine of USD 300 may be reasonable for workers at Vietnam at sites, according to, 93% of the respondents, except for crane operators and excavator operators who considered this at a rate of 79%. Most workers felt that violations by construction workers meant that they should pay for their violations, generally but operators using hazardous machinery and equipment agreed with this at a decreased level of nearly 20%, especially, in cases of greater fines such as USD 500 or USD 1000.

The 10% more of these workers agreed to issuing someone in their company the fine in cases of high fines such as USD 3000 or USD 6000. Specifically, all workers who replied to the questionnaire survey agreed that the penalty system should mean less money for them to pay and more money for their company to pay. More than 70% of vietnamese workers agree with the issuing of penalties against their violations. In contrast, more than 70 % of Korean workers do not agree to the issuing of penalties at construction sites.

Vietnamese workers at construction sites replied to the question stating “The imposition of penalties will help to guarantee worker’s safety at construction sites” by agreeing it was “helpful” Specifically, they agreed to the imposition of a penalty onto themselves but they would eventually like to avoid paying the penalty themselves. This psychological idea may be closely related to ensuring safety at construction sites.

Vietnamese workers agree to pay some penalty for violating HSE regulations which should be followed at construction sites but they do not want to pay it themselves i.e., out of their own pay.

Table 6: Result of correlation analysis, Korea

Variables	Experience	C2	C4	C7	C8	C9
<b>Experience</b>						
Pearson correlation factor	1	-0.118	0.029	-0.010	-0.106	-0.049
Significance probability (both side)		0.242	0.775	0.925	0.293	0.631
N	100.000	100.000	100.000	100.000	100.000	100.000
<b>C2</b>						
Pearson correlation factor	-0.118	1	0.556**	0.341**	0.377**	0.418**
Significance probability (both side)	0.242		0.000	0.001	0.000	0.000
N	100.000	100.000	100.000	100.000	100.000	100.000
<b>C4</b>						
Pearson correlation factor	0.029	0.556**	1	0.430**	0.373**	0.396**
Significance probability (both side)	0.775	0.000		0.000	0.000	0.000
N	100.000	100.000	100.000	100.000	100.000	100.000
<b>C7</b>						
Pearson correlation factor	-0.010	0.341**	0.430**	1	0.762**	0.671**
Significance probability (both side)	0.925	0.001	0.000		0.000	0.000
N	100.000	100.000	100.000	100.000	100.000	100.000
<b>C8</b>						
Pearson correlation factor	-0.106	0.377**	0.373**	0.762**	1	0.851**
Significance probability (both side)	0.293	0.000	0.000	0.000		0.000
N	100.000	100.000	100.000	100.000	100.000	100.000
<b>C9</b>						
Pearson correlation factor	-0.049	0.418**	0.396**	0.671**	0.851**	1
Significance probability (both side)	0.631	0.000	0.000	0.000	0.000	
N	100.000	100.000	100.000	100.000	100.000	100.000

\*\*Correlation factor is significant with 0.01 level

### CONCLUSION

It is thought that any reasonable countermeasures against accidents at construction sites could be established regardless of the worker's levels of field experience. It should be noted that economic differences can influence a worker's consciousness level at construction sites.

It is thought that construction workers with insufficient experience at construction sites should receive additional training, so as to concentrate on prevention measures to decrease field accidents.

### ACKNOWLEDGEMENT

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