

The knowledge and awareness of occupational health and safety requirements among civil engineering students in an Indonesian university

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ABSTRACT: Work accidents in the construction industry can happen at any time. This is because the construction industry involves heavy work, and has a high risk of accidents for its workers, caused by the materials used, equipment and the work environment. The high number of work accidents in Indonesia, especially in the construction sector, has prompted the government to introduce regulations related to the implementation of occupational health and safety in the workplace. The purpose of this study was to determine the level of influence of knowledge and awareness of occupational health and safety (OHS) on students' behaviour in the civil engineering programme, at Syiah Kuala University in Banda Aceh City, Indonesia. The data for this study was collected through a questionnaire survey distributed to 150 civil engineering students at the University, and then processed using descriptive statistics. The results show that the average score for the knowledge factor was 92.59%, and the occupational health and safety behavioural awareness factor was 91.97%. This high percentage indicates that almost the majority of civil engineering students at Syiah Kuala University understood OHS and were aware of its importance in construction projects.

Keywords: OHS occupational health and safety knowledge, awareness of OHS behaviour, construction projects, work accidents, civil engineering studies

INTRODUCTION

The number of accidents experienced by workers in the construction sector in Indonesia is still relatively high. According to the Directorate General of Construction Development of the Ministry of Public Works and Public Housing, the construction industry is the sector that has the highest accident incidence in Indonesia at 32%. The construction industry has a high level of danger, and work accidents can cause project delays and losses [1].

The high accident rate means that the prevention of work accidents in the construction sector needs to be treated seriously. Work accidents in the construction sector can be prevented by knowing and complying with the occupational health and safety (OHS) culture. This knowledge and compliance can reduce the possibility of work accidents for construction workers [2]. Several authors indicate that the construction industry is one of the most dangerous industries, and has the highest mortality rate among all types of industries, especially in developing countries [3-5].

An accident is an unplanned, unpredictable and unwanted event that results in loss, damage and injury [6]. Some individuals are more prone to work accidents than others even though they are exposed to the same risk [7]. Based on this observation, the cause of accidents could be attributed to the wrong action by some in the workforce. However, the causes of accidents do not only stem from individual actions, but are related to other factors, such as the social environment, organisation and management [8]. Often, they are caused by more complex factors, such as planning, communication, migrant workforce or project participants [9][10].

There are different types of work accidents, and they may include: falling from a height, stumbling on the same level, absorption, being hit by another person or an object, slipping, tripping, burning and being electrocuted. Being hit by another person or an object is the most common type of work accident [11]. However, falling from a height is considered the most dangerous type of accident in the construction sector, as it may result in a serious injury or fatality [11].

The conclusion that can be drawn from the outlined causes of construction accidents is that the indifference of the parties involved in the construction sector to the importance of OHS and the lack of knowledge of OHS by the workers are some of the most critical factors. Workers who attend proper occupational health and safety training, can identify hazards and thereby improving health and safety conditions at their workplace [12][13]. With the implementation of

OHS, it is expected that a company can prevent and reduce the number of accidents, illnesses, disabilities or death at the construction site. The company would also need to secure work equipment that can prevent harm, wastage of labour and ensure a conducive workplace, all of which can lead to increased work productivity.

The high number of work accidents in Indonesia, especially in the construction sector, has prompted the government to ensure that occupational health and safety are properly regulated and implemented at workplaces.

According to Government Regulation Number 50/PP/2012, every company that employs 100 workers or more, and where the workers may be at risk of accidents, such as falls, fires, pollution, explosions or diseases, has to implement an occupational health and safety management system.

The civil engineering programme at Syiah Kuala University also plays an important role in developing and enforcing OHS knowledge and awareness. This is because civil engineering educational institutions are the main source of construction workers. The level of understanding of OHS by civil engineering students as prospective construction workers is very important in reducing the rate of work accidents. Therefore, this case study was conducted at the civil engineering programme at Syiah Kuala University, in Banda Aceh City, Indonesia.

This study aimed to determine the level of understanding and awareness of OHS in relation to the construction sector among civil engineering students at Syiah Kuala University. This study is expected to be of value to institutions offering civil engineering programmes as it highlights the importance of increasing the awareness of OHS relating to the construction sector from an early stage of studies.

RESEARCH METHOD

The population in this study were students from the Department of Civil Engineering in the Faculty of Engineering at Syiah Kuala University; namely, the students of class 2017 and 2018, where the total population was 240. Of the total population, the margin of error was set at 5%, then using Slovin's formula, a sample of 150 students was obtained. The data used in this study were collected through questionnaires distributed to civil engineering students at the University. Probability sampling was used, which is a sampling technique that provides equal opportunities for each member of the population to be selected [14], and simple random sampling is a random sampling of members of the population.

Table 1: Demographic information of participants.

Class	Department	Male	Female	Total	Percentage (%)
2017	Civil Engineering	72	49	121	50.42
2018	Civil Engineering	75	44	119	49.58
Total				240	100.00

The questionnaires relating to OHS behaviour and requirements were distributed to the selected population of students. The students were asked to respond to 16 questions that gauged their knowledge and awareness of OHS. The OHS factors and indicators included in the questionnaire were based on Government Regulation No. 88 of 2019 concerning occupational health, and are shown in Table 2.

In this study, the Likert scale was used to assess perceptions, attitudes or opinions of a person regarding OHS at workplace. The Likert scale is appropriate in this case as the questions regarded the extent to which the respondents agreed or not agreed with a given statement about a workplace situation or event [15].

Table 2: Knowledge and awareness of the occupational health and safety behaviour - factors and indicators.

Factor	Indicator		Code item
Knowledge of occupational health and safety (X1)	1	It is very important to know and implement OHS regulations in construction work	A1
	2	Always prioritise OHS in construction work	A2
	3	The goal of OHS is to provide safety for workers	A3
	4	Accidents in construction work are caused by a lack of understanding of OHS by workers	A4
	5	Work accidents are caused by the negligence of workers not complying with OHS regulations	A5
	6	Work accidents can be prevented by using OHS-approved equipment	A6
	7	Prevention of work accidents involves the proper use of tools	A7
	8	The use of personal protective equipment (PPE) at work is to prevent worker accidents in construction work	A8

Awareness of occupational health and safety behaviour (X2)	1	When carrying out a job, it is necessary to follow OHS regulations to avoid danger	B1
	2	Wearing PPE at work ensures safety	B2
	3	Not using and playing with cell phones, while doing work is important for safety	B3
	4	Cleaning the workplace after completing a job ensures safe and health work conditions	B4
	5	Workplaces need to be properly cared for to be safe for workers	B5
	6	Always obey work rules	B6
	7	A comfortable workplace creates more comfortable working atmosphere	B7
	8	Workers should not force themselves to work if they experience personal problems	B8

Respondents were expected to indicate their level of agreement or disagreement with the 16 statements regarding their individual behaviour by choosing one of the following five options: strongly agree - 5, agree - 4, undecided - 3, disagree - 2, strongly disagree - 1 [16].

Data Analysis

In this study, descriptive statistics were used to analyse the data, and aided the collection and data presentation. The overall aim is to provide an overview of the object of research through sample or population data [17].

The descriptive statistics method in this study aimed to obtain the respondents' opinions about the level of influence of the OHS knowledge and awareness factors on their behaviour.

RESULTS AND DISCUSSION

Descriptive Statistics

Descriptive statistics analysis allows to use the mode value to group the most frequently appearing data, so that the most chosen responses are easily obtained. The results of the mode score can be seen in Table 3.

Table 3: The level of influence of OHS knowledge and awareness factors based on the analysis.

Code item	Score					Mode	Category
	1	2	3	4	5		
A1	0	0	15	58	77	5	Strongly agree
A2	0	0	15	76	59	5	Strongly agree
A3	0	0	3	46	101	5	Strongly agree
A4	0	0	0	55	95	5	Strongly agree
A5	0	3	6	37	104	5	Strongly agree
A6	0	0	0	46	104	5	Strongly agree
A7	0	0	6	43	101	5	Strongly agree
A8	0	0	0	55	95	5	Strongly agree
B1	0	0	3	52	95	5	Strongly agree
B2	0	0	0	55	95	5	Strongly agree
B3	0	0	3	43	104	5	Strongly agree
B4	0	3	6	31	110	5	Strongly agree
B5	0	0	12	58	80	5	Strongly agree
B6	0	0	15	58	77	5	Strongly agree
B7	0	0	15	76	59	5	Strongly agree
B8	0	0	3	46	101	5	Strongly agree

Table 3 shows that the level of influence of OHS knowledge, and OHS awareness is in the category of strongly agree (5) for all factors. This proves that all respondents already understand the importance of implementing occupational health and safety in construction projects, both in terms of OHS knowledge and OHS behavioural awareness. The high level of understanding of OHS by respondents was due to their participation in OHS education courses, and most of the respondents had attended OHS training conducted by Syiah Kuala University. Considering the awareness of the importance of implementing OHS at workplace, it is hoped that the rate of work accidents will decrease when prospective graduates commence working in the construction sector. OHS education and training plays an important role in reducing the number of unsafe acts and behaviours, and can reduce the number of work accidents in the construction industry [18].

Table 4 shows that in regard to the OHS knowledge factor, the highest Likert scale value (5 - strongly agree) was chosen by 66.06% of the respondents, and the same high value in regard to the OHS behavioural awareness factor was chosen by 64.72% of the respondents.

Table 4: Likert scale scores in percentages.

No	Likert scale	Percentage (%)
X1	Knowledge of OHS	
1	Strongly disagree	0
2	Disagree	0.41
3	Undecided	3.46
4	Agree	30.07
5	Strongly agree	66.06
Total		100.00
X2	Behavioural awareness of OHS	
1	Strongly disagree	0
2	Disagree	1.19
3	Undecided	2.48
4	Agree	31.62
5	Strongly agree	64.72
Total		100.00

The data in Table 5 show that the percentage of the average score for the OHS knowledge factor was 92.59%, and for the OHS behavioural awareness factor was 91.97%. These results demonstrate that almost the majority of civil engineering students at Syiah Kuala University understood the importance of OHS on construction projects by providing appropriate responses regarding the implementation of OHS regulations at workplace.

Table 5: OHS knowledge and behavioural awareness factors in percentages.

Code item	Factor	Percentage (%)	Average score (%)
A1	It is very important to know and implement OHS regulations in construction work	98.00	92.59
A2	Always prioritise OHS in construction work	95.87	
A3	The goal of OHS is to provide safety for workers	94.27	
A4	Accidents in construction work are caused by a lack of understanding of OHS by workers	88.27	
A5	Work accidents are caused by the negligence of workers not complying with OHS regulations	86.27	
A6	Work accidents can be prevented by using OHS-approved equipment	93.07	
A7	Prevention of work accidents involves the proper use of tool	92.67	
A8	The use of personal protective equipment (PPE) at work is to prevent worker accidents in construction work	92.27	
B1	When carrying out a job, it is necessary to follow OHS regulations to avoid danger	93.87	91.97
B2	Wearing PPE at work ensures safety	95.87	
B3	Not using and playing with cell phones, while doing work is important for safety	94.27	
B4	Cleaning the workplace after completing a job ensures safe and health work conditions	87.87	
B5	Workplaces need to be properly cared for to be safe for workers	85.87	
B6	Always obey work rules	93.07	
B7	A comfortable workplace creates more comfortable working atmosphere	92.67	
B8	Workers should not force themselves to work if they experience personal problems	92.27	

As mentioned above, students at Syiah Kuala University have already acquired some OHS knowledge and behavioural awareness by participating in relevant courses on construction projects in the Civil Engineering Department, and also some respondents have attended OHS training offered every year and obtained the certification. This training and certification reflect the University and especially the civil engineering programme coordinator's concern about the OHS

readiness of prospective graduates in their future workplaces. It is essential that all the stakeholders are fully aware that OHS education and training play an important role in reducing the number of unsafe acts and behaviours, and can reduce the number of work accidents in the construction industry [18].

CONCLUSIONS

In the study outlined in this article, the average score based on respondents' opinions reached more than 90% in regard to OHS knowledge and OHS behavioural awareness. It indicates that Syiah Kuala University as one of the universities that provide prospective workers for the construction industry has also made efforts to reduce the number of work accidents by incorporating OHS education in the curriculum, and OHS training provision and certification. This is done to increase students' understanding of the importance of OHS at workplace, and universities need to implement training programmes to develop a broader range of student skills that ensure their safe work practices in the future [19].

The Bachelor of Civil Engineering is a major that prepares prospective graduates to work in the construction sector, and in general, they hold quite important positions while working on various construction projects. Thus, they have to play a more decisive role in creating a safe work environment, compliant with OHS regulations.

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BIOGRAPHIES



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