

Full Length Research Paper

A research on work accidents in forest products industry in Duzce

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This study aimed at examining the work accidents and their possible causes experienced by the workers of the industry of forest products active in Duzce and their occupational lives, and determining the solutions suggested. In this study, a questionnaire method was used as a data gathering tool. The questionnaire used in the study composed of 4 main parts and 46 questions. In the forest products industry in Duzce, there are 3500 workers according to the 2010 data. It is required that a minimum of 250 workers should be reached with 90% trust level. 264 workers were reached to increase the reliability of the study. As a result of the study, it was seen that 6.8% of the participants experienced a certain work accident. It was detected that the participants experienced work accidents between the hours of 13 to 15 at most. Thursday and Friday were detected as the days in which work accidents mostly occurred. It was suggested to the administrators of the management at the end of the study that, the participants should be given instructions on the subjects of occupational health and occupational safety when they newly started to work, and these instructions should be carried on at certain periods (once in 6 months).

Key words: Work accident, occupational safety, forest products industry, Duzce, Turkey.

INTRODUCTION

The unexpected incidence that happens suddenly, with an outer effect and unintentionally, and that harms humans and/or the enterprise devices is called accident. In accidents, only humans or only enterprise devices can be harmed; but in many cases, both of them are harmed, as well. According to the definition of accident, for an incidence to be called accident, three factors are required: it must happen suddenly, unexpectedly and it must cause pecuniary and intangible loss (Yildirim, 1989). While every unexpected incidence causing damage or hurt is generally termed as accident, they cannot always be called work accident, because the term work accident is a little bit different from the general term of accident (Bigat, 2006). Work accident, differently from accident, must have the qualities like, it must be related to the work being done, it must happen in the work place and it must harm the worker, instantly or later, physically

and intangibly (Yildirim, 1989).

According to the definition put forward by World Health Organisation (WHO), work accident is an incidence that is unexpected, and generally causes personal injury, damages the machines and equipments and stops operation (Dabak, 1992). According to the International Labour Organisation, the unexpected incidence that causes a certain damage or hurt is called accident (Turk, 2006).

In the emergence of the terms of accident and work accident, is the fact that humans used the mines present in nature to meet their needs like sheltering and protection, and the health problems coming up during the process of hoisting these mines played a great role, and the findings formed the basis for the first studies on work health and safety (Durdu, 2006).

Unless work health and safety are given importance, it can be said that work accidents and occupational diseases will increase. The ones who are mostly affected will be those who are working at first degree (Yigit, 2005). According to the data of ILO:

1. Nearly 6,000 people lose their lives every day because

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of work accidents or occupational diseases. Annually, 350,000 people lose their lives because of work accidents and 1.700,000 people because of occupational diseases in total.

2. Every year, 270 million work accidents happen and 160 million people come down with occupational diseases. Almost 50% of the work accidents happen in the work places having 9 or less workers. These work places represent 90% of the total small and medium scaled enterprises (SME) (Yardim et al., 2007).

Providing work safety in the work place is primarily a humanitarian obligation, and further, it is a legal obligation. A physically and psychologically negative working environment, chemical factors, physical factors, biological factors, ergonomic factors and personal qualities generally cause occupational diseases, work accidents and mental disorders (Kacmaz, 1999; Ayhan, 2004).

The leading motives of work accidents are discussed under 3 main topics, which are: the environmental factors like illumination, heat, moisture, noise, machines, slippery floor, the human related factors like carelessness, inexperience, tiredness, negligence, lack of education and the fact that required education is not given (Hendem, 2007).

To overcome lack of education, which is one of the biggest reasons for work accidents, qualified and educated human force must be trained, and this education must be placed on strong basis and must be developed continuously. Educated employee and employer should be made one of the important elements of work life (Bigat, 2006).

Protection from work accidents depends on the principal removal of unsafe personal behaviours and unsafe mechanical conditions. Removal of unsafe environmental conditions can be possible in a short time, but removal of unsafe personal behaviours is only possible by the execution of long-lasting education and training programmes. The most important way of protection from work accidents is the education of workers and employers. The reflection of the studies of education and training on worker's health and work safety will be on social level rather than individual level (Turk, 2006).

One of the most important topics in preventing work accidents is using appropriate record systems. The accidents that mostly cause light scars and even to no scar are unnoticed. Recording all the small and big accidents is important in terms of the fact that small accidents are the indicators of big accidents (Dabak, 1992). Moreover, the proper records of accidents enable accident analysis, providing accident statistics and making comparisons with the values in various resources (Dabak, 1992; Turk, 1996). Thus, taking due precautions to correct the faults by seeing is enabled.

To prevent work accidents and to provide a safe working environment for workers, a comprehensive policy of worker's health and work safety, which is determined

with the participation and support of social parts, should be formed, and this policy should be enabled to be executed in the working places actively in the direction of practice (Turk, 2006).

Whatever the factors are, in determining the protection precautions to prevent work accidents, analysing the reason for every accident, taking due precautions make removal of repetition of the accident possible (Sabuncuoglu, 2000).

In terms of work accidents, both the state and the enterprise should take various precautions to reduce the possibilities of work accidents. The things the state should do about this subject include: compulsory and prescriptive precautions by laws, rules and regulations; inspection of working places by the labour directorate and providing the execution of work place medicine. The enterprises should take precautions related to controlling the unsecured conditions and unsecured behaviours in work places (Sabuncuoglu, 2000).

Many factors play a role in the fact that work accidents and occupational diseases are seen in high rates in our country; however, the fact that enough attention is not paid for obeying the rules related to work safety may be the most important factor (Ozergun, 2008).

There are two main points that enterprises should not ignore. One of them is to increase efficiency by providing protection security, and the other is to provide security for the enterprise. The enterprises in the aim of reaching that goal must accept the fact that it is compulsory that the workers should be protected from work accidents and occupational diseases, and they should be provided with a healthier environment, which are the aims of the studies of work health and work safety.

MATERIALS AND METHODS

Duzce, where every sub-sector in the area of forest products industry is active, is used as the material of this study. In the study, we tried to analyse the work accidents experienced by the workers of forest industry enterprises, and the precautions that are required to prevent work accidents are explored. In the study carried out in January to April 2010, according to the records of the Chamber of Commerce and Industry of Duzce, there are 3500 workers in the forest industry enterprises (Anonymous, 2010).

The study is carried out with a face to face questionnaire method. Within the scope of this study, 3500 workers were taken into consideration and its sample size was calculated for 90% reliability levels and 5% error margin, and the minimum number of questionnaire to be carried out is found as 249.7. To increase the reliability of this study, 264 workers were reached in total. The participants were chosen coincidentally.

The questionnaire used in this study is composed of 4 main parts and 46 questions. With the questionnaire used, some demographic qualities of the workers, whether they experienced any work accident or not, the possible reasons for work accidents and the solution suggestions of the participants were aimed to be put forward.

The variables in the questionnaires received from the participants were coded, and a data base was set in SPSS (2003), and the required statistical evaluations were done.

It was supposed that the workers of the forest industry enterprise

Table 1. Some of the demographical qualities of the workers.

Worker properties		Frequency	Percentage
Sex	Male	247	93.6
	Female	17	6.4
Age group	15-24	49	18.6
	25-34	132	50.0
	35-44	59	22.3
	45-55	24	9.1
Marital status	Married	168	63.6
	Single	94	35.6
	Other	2	0.8
Educational status	Illiterate	5	1.9
	Primary school	72	27.3
	Secondary school	64	24.2
	High school	94	35.6
	Graduate school	16	6.1
	University	13	4.9

of Duzce participating in this study answered the questions of the questionnaire according to their objective knowledge and experiences.

RESULTS

Analysis of validity and reliability

Validity analysis analyses whether a measurement instrument can really measure the expected qualities to be measured. In this study, factor analysis is used to determine the structural validity. Whether the data is suitable for vector analysis or not is found with the coefficient of Kaiser-Meyer-Olkin (KMO). The value taken by Barlett's test for sphericity and its sensibility examine whether the variables show correlation with each other or not (Sharma, 1996; Buyukozturk, 2002). In the study, KMO is 0.919; the result of Barlett's test is 4146,642 and Sig. value is 0.000. These proportions show that the data group is suitable for factor analysis and they do not pose any problem for validity.

In this study, reliability analysis was performed to the data on the basis of inferential statistics. The general reliability value (Cronbach Alpha coefficient) of the measurement used in the study given at the end of the reliability analysis was found as 0.941. When this result is taken into consideration, it was detected that the measure had a high reliability level. The fact that alpha is smaller than 0.40 shows that the measure is not reliable; however, between 0.40 and 0.60, it has low reliability, between 0.60 and 0.80, it is reliable, and between 0.80 and 1.0, it is highly reliable (Ozdamar, 2002).

Analysis of some of the demographical features

The results of the analysis of some of the demographical features like gender, age, marital and educational status of the workers are given in Table 1.

93.6% of the workers participating in the questionnaire were male, and 6.4% of them were female. It was detected that 50% of the workers are between the ages of 25 to 34, 1.9% of them are illiterate and only 4.9% of them are university graduate.

The occupational experiences of the workers were analysed with the help of the time span of them doing the same job and working in the same place. At the end of the study, as the time span of the workers doing the same job, it was found that the same job was done by the workers between 1 and 5 years at the rate of 48.9%, between 6 and 10 years at the rate of 22.3%, between 11 and 15 years at the rate of 14% and 15 years or more at the rate of 14.8%.

Analysis related to work accidents

It was found that 44.7% of the participants had an education on work safety, and 55.3% of them did not receive any education related to work safety. It was stated in the study carried out by Gedik and Akyuz (2004) that the rate of being uneducated about occupational issues of the workers of the industry of forest products was higher (94.1%). In the study carried out on 250 workers by Durdu (2006) in 3 enterprises producing soap and detergent, it was found that 91.6% of the workers

received an education related to work safety and occupational health.

It was detected that the workers had an education on work safety at the rate of 42%, on worker's health at the rate of 25.7%, on immediate aid at the rate of 23.5% and on first aid, civil defence and fire at the rate of 8.8%. In the study carried out by Durdu (2006), protective equipment, fire and first aid are the primary education subjects.

95.1% of the participants stated that receiving education on work safety in working places would be effective in reducing work accidents. A statistically sensible difference was detected between the statement of whether or not to receive an education work safety and the educational levels of the participants ($P < 0.05$). In the study carried out by Durdu (2006), a statistically sensible relation was found between the educational levels of the participants and their awareness of the dangerous situations for them. A statistically sensible difference was detected between the size of the enterprise according to the number of workers and giving education on work safety in the enterprise ($P < 0.05$). According to Ozergun (2008), lack of education underlies the basis of solutions of the problems in our country related to workers health and work safety. A mass of workers who are more conscious about education and work safety will be formed. The primary dimension of the education related to the subject should be raising awareness about the subject. This awareness, after grasping the importance of the matter, is about the fact that everybody should learn how to adapt to the behaviours required by the subject of workers' health and work safety; and they also should make them habits for them without the need of warning.

It was found that 77.7% of the workers used protective equipment in the work place in terms of work safety. Among the protective equipments used by the workers in the work place, gloves are the mostly used protective item with the rate of 38.5%. In the work places, masks are used as protective equipments at the rate of 28.5%, protective eyeglasses are at the rate of 18.1% and helmets are at the rate of 11.8%. It was also detected that, under the option of "other", headphones and earplugs were used as protective equipments at the rate of 3.1%. In this study, a statistically sensible difference was found between the usage of masks and the ages of the participants ($P < 0.05$). It was found that the older the participants were, the lower the rate of using masks. A statistically sensible difference was detected between the educational status of the participants and the usage of helmet used as a protective item for work safety ($P < 0.05$). The more educated the workers are, the higher the rate of helmet usage. A sensible difference between the occupational experiences of the workers and the analysis carried out for masks and helmets used for work safety was also detected ($P < 0.05$). It was seen that the more experienced the workers were, the lower the rate of mask usage. It was found that the participants having occupational

experience between 11 to 15 years used helmets at a higher rate than other participants. In the study of Gungor (2008), 72 of 300 large industrial enterprises, in terms of the level of the execution of work health and work safety, the statement which the participant enterprises agreed mostly on was the statement that personal protective equipments and signs should be used in their enterprises. In a research carried out by Gedik and Batu (2005) in forest productions of Duzce oriented to the workers, it was stated that the participants emphasised that their enterprises were efficient ergonomically.

It was found that 6.8% of the workers experienced a certain work accident and 33.4% of these accidents happened between 13 and 15 h. The workers stated that 44.4% of these accidents took place on Thursdays and Fridays. In the study carried out by Gedik and Akyuz (2004), 49% of the workers of the industry of forest products complained about work-related pains in evening hours. In the study carried out by Durdu (2006), it was detected that the rate of workers experiencing work accidents was 11.6%. In the study carried out in 99 different enterprises by Hatipoglu (2006), in 54% of the enterprises, less than 10 work accidents happen annually, in 23% 10 to 20 work accidents happen annually and in 23% of them more than 20 work accidents happen annually. In the study carried out by Gedik et al. (2008) in the industry of forest products of Duzce, it was also detected that there were various problems in certain factors at high levels and in other factors it was just partly.

It was detected that 16.7% of the workers had permanent injury after the accident, and the time span of turning back to active work after the accident was changing between instantly (5.5%) and 45 days (16.7) (Table 2). In the study carried out by Hatipoglu (2006), the workers' need of walking the wards after the work accident changed between 1 and 5%. According to the results of the statistical analysis, a sensible difference was detected between the participant workers, occupational experiences and the statement of experiencing work accident ($P < 0.05$). It was found that, in that difference, the ones whose occupational experience is 1 to 5 years and 11 to 15 years experienced less work accidents than the ones whose occupational experience is 6 to 10 years and above 16 years. According to the result of the statistical analysis, a sensible difference was detected between the occupational experiences of the participants and whether they experienced any work accident or not ($P < 0.5$). And it was seen that the more experienced the workers were, the less work accidents they experienced.

According to the participant workers, studies of work analysis are carried out at the rate of 47% to prevent work accidents. 62.1% of the workers claim that no regular education is given in their work place on work accidents and work safety. Also, according to the workers (62.5%), no education is given on preventing work

Table 2. The situation of the workers' experiencing work accident.

Judgement	Options	Frequency	Percentage
Have you ever experienced any work accident in your working place?	Yes	18	6.8
	No	246	93.2
The time zone in which the accident occurred	8-10	2	11.1
	10-12	4	22.2
	13-15	6	33.4
	15-17	4	22.2
	17-19	2	11.1
	Total	18	100.0
	The day the work accident occurred	Monday	3
Tuesday		2	11.1
Wednesday		3	16.7
Thursday		4	22.2
Friday		4	22.2
Saturday		2	11.1
Total		18	100.0
Did you have any permanent injury after the accident?	Yes	3	16.7
	No	15	83.3
	Total	18	100.0
The time span of turning back to active work (day).	Immediately	1	5.5
	1	2	11.1
	2	1	5.5
	3	3	16.7
	5	3	16.7
	7	1	5.5
	10	2	11.1
	20	2	11.1
	45	3	16.7
	Total	18	100.0

accidents when they newly started to work. In the study of Durdu (2006), the rate of those who receive education on work health and safety once a month is 25.6%, those who receive it once in three months is 37.2%, those receiving it once in six months is 20% and those receiving it at least once in a year is 12.8%.

A statistically sensible difference was detected between the ages of the participants and the statement of whether or not the beginner workers received a harmony education to prevent work accidents ($P < 0.05$). In this study, the older the participants were, the lower the rate of receiving harmony education. A statistically sensible difference was defined between the educational statuses of the participants and the statement of receiving a regular education on work accidents and work safety in their working place ($P < 0.05$). In this study, it was seen that the ones who graduated from primary schools and

university attended the education programme more than the other graduate groups. A statistical difference was detected between the variable of the size of the enterprise and the statements of carrying out work analysis and whether or not to provide the beginners with a harmony education to prevent work accidents ($P < 0.05$). It was seen that, as the size of the enterprise grew, the enterprises gave more importance to studies of work analysis to prevent work accidents, and they provided the beginners with more harmony programmes to prevent work accidents.

According to the participant workers, their enterprise is examined regularly by official authorities in terms of work health and work safety at the rate of 53.4%. According to the participant workers, an accident statistics is held in their enterprise at the rate of 53.8%. However, it was said that, after a work accident, reports of the accident and

injuries related to the accident was held at the rate of 68.9%. In the study carried out by Sevim-Korkut and Gedik (2010) in the industry enterprise of forest productions of Duzce, the participants agreed at the least level with the fact that the present laws about work health and work safety were sufficient. In the study, a statistically sensible difference was seen between the educational status of the participants and the statements of a report being written about accident and injury after a work accident happened by the related persons, and writing regular accident reports ($P < 0.05$). It was detected that as the levels of educational status of the participants get higher, an increase occurred both in the rates of regulating a report and writing statistics of accident. A statistically sensible difference was seen between the variable of the size of enterprise and the statements of a report being written about the accident and injury after a work accident happened by the related persons and writing regular accident reports ($P < 0.05$). It was detected that as the size of the enterprise grew, an increase occurred both in the rates of regulating a report and writing statistics of accident. In a study carried out by Gungor (2008), the enterprises participated at the least rate to studies on work health and work safety, and writing regular reports of accidents.

Analysis of probable reasons of accidents

In the study, according to the participants, 18 variables were used in examining the probable reasons of accidents. According to the participants, among the most important reasons for the work accidents happening in the work place, there are: lack of occupational experience, excessive exhaustion and lack of attention, and the workers lack of education on work health and work safety. In 2004, the workers (78.4%) of the industry of forest products stated that the primary reason for the work related psychological disorders is as a result to the stressful working environment (Gedik and Akyuz, (2004). In the study carried out by Durdu, carelessness and having no precaution were defined as the most important reason for accident, and these were followed by the fact that the workers did not use protective equipments and they lacked education. Gungor (2008) stated that, in general points, 72% of work accidents stemmed from personal reasons, 22% from economical and 6% from technical. When the special reasons for the work accidents in the enterprises were examined specially, unsafe behaviours by 81%, lack of education, excessive work burden and insufficient precautions against accidents by 6% were defined as the important factors.

As a result of the analysis between the occupational experiences of the workers and the variable of inexperience, which is the most important variable among the probable reasons for accidents, sensible differences were detected ($P < 0.05$). As occupational experience increases, the participants believe that they will experience

less accident because of that statement. As a result of the analysis between the educational status of the participants and the variables of exhaustion and lack of attention, sensible differences were seen ($P < 0.05$). Mostly the participants having education on work safety stated that they took protective precautions of work safety. According to the participant workers, lack of friendly relations between the workers of the enterprise, insufficient inner-examination and insufficient social activities in the work place are defined as the least effective factors among the probable reasons for accidents (Table 3). As a result of the analysis between the variable of the size of the enterprise and the statement that the enterprises do not do inner-examination, a sensible difference was detected ($P < 0.05$). At the end of the study, it was seen that as the size of the enterprise where the workers are working grew, the inner-examinations carried out most.

Analysis of the things to do to prevent work accidents

In this study, the analysis of preventing work accidents and to-dos were analysed with the help of 6 variables. At the end of the analysis, it was found that the workers agreed mostly with the fact that education on work health and work safety should be given in their enterprises. This statement was followed by the statement that prevention steps should be taken before any harm or defect came out in the enterprise and required warning signs about work accidents and work safety should be hanged (Table 4). In the study carried out by Durdu (2006), the participants (76.8%) detected that the employer, the expert/doctor of work place work safety, the workers and the state were responsible for preventing work accidents. The efficiency degree of an employer's to prevent work accidents on his own is approved by 12%. According to Kalyoncu (2007), despite the positive developments, a lot of things should be done in the area of workers health and safety with the approach of continuous improvement. In a study carried out by Sevim-Korkut and Gedik in (2010) in the industry of forest productions of Duzce, 93.2% of the participants stated that personal protective equipments related to work health and safety and warning signs about work safety were present in their enterprises.

As a result of the statistical analysis carried out between the occupational experiences of the participants and the statements of the variables of the size of the enterprise and providing education on work health and work safety according to the workers in their enterprise, and developing the mentality of preventing harms and defects in the enterprise before they emerge, sensible differences were seen ($P < 0.05$). As the occupational experiences of the participants increase and the size of the enterprises grows, the rate of agreeing with the fact that education on work health and work safety should be

Table 3. Probable reasons for accidents according to the workers.

Probable reason for accident	Average	Standard deviation
Inexperience	3.34	1.38
Exhaustion and lack of attention	3.30	1.33
The worker's lack of education on work health and work safety	3.25	1.39
Absence of protective precautions for work safety	3.21	1.39
Excessive work burden	3.20	1.33
Personal problems of the workers (psychological and physical defections)	3.15	1.38
Stress	3.14	1.40
The long hours of working	3.10	1.32
The machines and equipments having no protectors	3.09	1.45
Unsafe behaviours and liability to cause an accident of the worker (awkwardness)	3.08	1.44
Negative working conditions (air-conditioning, illumination, dust and noise)	3.02	1.28
Working with lack of satisfaction	3.01	1.30
Lack of examination by the state	3.00	1.41
Machines and equipments without maintenance	2.92	1.47
The obligatory movement related to the work	2.86	1.20
Lack of social activities in the working place	2.77	1.34
Lack of inner-examination by the enterprise	2.69	1.30
Lack of friendly environment in the working place	2.56	1.32

Table 4. The things to do to prevent work accidents.

Precautions to prevent work accidents	Average	Standard deviation
Educations on work health and work safety should be provided in your enterprise	4.11	1.15
You should use a preventive approach against damage and loss in your enterprise	3.95	1.22
Warning signs should be hanged on proper places	3.86	1.31
The physical conditions of the working place should be improved	3.78	1.17
The present legal regulation on work health and work safety in our country should be revised	3.74	1.18
Working hours should be revised	3.49	1.26

given. As the size of the enterprise grows, a partly decrease happens in the rate of agreeing with the statement of developing the mentality of preventing any harm or defect in the enterprise before they emerge. As a result of the statistical analysis between the variable of the size of the enterprise and the statement that the present legal regulation on work health and work safety in our country should be revised, a sensible difference was detected ($P < 0.05$). As the size of the enterprise grows, a decrease in the rate of agreeing with the fact that the present legal regulations on work health and work safety should be revised is seen. In the study carried out by Sevim-Korkut and Gedik (2010) in the same area, it was found that the managers of the enterprises do not have enough knowledge and experience on work health and work safety.

DISCUSSION AND SUGGESTIONS

At the end of the study, it was found that half of the

workers did not receive any education on work safety; 95.1% of the participants stated that providing an education on how work accidents would be effective on reducing work accidents.

It was seen that 78% of the participant workers used certain equipment for work safety. It was also seen that these protective items showed difference according to the work, and the protective items were used in a mixed way at a very low rate.

According to the participants, the rate of experiencing work accidents is found as 6.8%, and it was seen that work accidents mostly occurred at 13 to 15 h, which is the after their lunch time.

We can say that work analysis to prevent work accidents in the enterprises are not carried out sufficiently and regular educations on work accidents and work safety are not provided in a high level.

According to the participants, inexperience, exhaustion and lack of attention, lack of education on work health and work safety and insufficient precautions on work safety are the most important reasons for accidents.

The participants stated that to prevent work accidents in the work places; first, workers should be given educations on work health and work safety, and they also claimed that accidents would be prevented significantly by adopting the mentality of preventing any harm or defect before they emerge.

By considering the results, the enterprises suggested that:

1. The role of educating the workers of the enterprise is great. The workers should be provided with the required education on work health and safety.
2. Especially, small sized enterprises should educate their workers more about work health and safety.
3. The fact that the beginners should be given educations on work, work health and safety must be given importance. The managers of the enterprises should adopt that situation as a policy for their enterprise.
4. To provide a healthy and safe working environment in the enterprises, all the workers participation is needed.
5. The enterprises should not make their workers start to work right after lunch. It is required that after lunch, the workers should not start to work for a while, and they should rest and digest their food. Thus, they can start to work with a strong and careful mind between the hour of 13 and 15 when work accidents mostly occur.
6. The managers of the enterprises should carry out work analysis to prevent work accidents.
7. The things to do in possible negative occasions should be planned, present problems should be detected regularly, and what is necessary should be done to remove these problems immediately.
8. The managers of the enterprises are advised not to allow beginners to do jobs that have a high degree of causing accidents until they have enough experience.
9. It should not be forgotten that providing work health and safety is only possible by the mutual effort of all the parts in their work life and in adopting the subject.
10. The workers should be motivated to use proper personal safety items against work accidents, and when needed, sanctions.
11. In the frame of university-industry cooperation, a collaboration and communication between the enterprises and the science branches of universities related to work health and safety, so, consciousness about work health and safety should be increased.
12. The fact that there is no scientific research and education foundation on work health and safety causes the inability to establish strong relationships between work health and safety and working conditions. To prevent this, it is suggested that departments and areas of expertise on work health and safety should be established in universities.

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